Title: Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC

Dear Prof. Koji Miwa, Chair of J-PARC Hadron Hall Users' Association,

We have known that the activities at the J-PARC Hadron Experimental Facility are well acknowledged in particle, hadron, and nuclear physics, and their related fields. In particular, we believe that their projects conducted at J-PARC are internationally important and need further support from the world-wide community. It would be our great pleasure to strongly support the Hadron Experimental Facility Extension Project at J-PARC, and, activities of HUA for the project. We hope a further success in the new project.

Sincerely

Franco Garibaldi
Director of Research
National Institute for Nuclear Physics (INFN)
and
Guido Maria Urciuoli
Senior Researcher
National Institute for Nuclear Physics (INFN)

UCONN | COLLEGE OF LIBERAL ARTS AND SCIENCES
Department of Physics

August 20, 2021

Subject: International Letter of Support for the Hadron Experimental Facility Extension Project at J-PARC

Dear Prof. Koji Miwa, Chair of J-PARC Hadron Hall Users' Association:

It is widely recognized throughout the international community of physicists that the activities carried out at the J-PARC Hadron Experimental Facility are highly regarded within the fields of particle, hadronic, and nuclear physics. In particular, it is our firm and steadfast belief that these projects conducted at J-PARC are of world-wide significance. As such, it is with great pleasure to write this letter offering our strong support for the Hadron Experimental Facility Extension Project at J-PARC and all the associated activities of HUA comprising the scope of this project.

We hope and expect great success with this new project. Please let us know how we may help with this success.

Sincerely yours,

Kyungseon Joo
Professor
University of Connecticut
Chair of
The CLAS Collaboration

Philip L. Cole
Professor and Chair
Lamar University

Chaden Djalali
Professor
Ohio University

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UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

Department of Physics
1110 West Green Street
Urbana, IL 61801-3080

August 17, 2021

Prof. Koji Miwa,
Chair
Hadron Experimental Facility Extension Project at J-PARC

Dear Prof. Miwa,

I am writing to express my strongest support for the Hadron Experimental Facility Extension Project at J-PARC. As a world-class facility for fundamental basic research in nuclear and particle physics, J-PARC provides intense secondary kaon beams not available in any other facilities world-wide. In particular, the hadron physics and the hypernuclear physics programs to be explored with the Hadron Hall Extension Project are unique and complementary to physics programs being pursued at other international facilities, such as the Jefferson Laboratory electron accelerator. A successful and timely completion of the Hadron Hall Extension Project would help realizing the immense scientific potential of J-PARC, and could lead to many exciting new discoveries.

Sincerely yours,

Jen-Chieh Peng

Jen-Chieh Peng
Professor of Physics
University of Illinois at Urbana-Champaign

Telephone (217)-244-6039 • Fax (217) 333-1215 • E-mail: jcpeng@uiuc.edu

UNIVERSITY OF SASKATCHEWAN

Department of Physics and Engineering Physics
Physics Building 116 Science Place Saskatoon SK S7N 5E2 Canada
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Email: phys.engphys@usask.ca Web: artsandscience.usask.ca/physics/

Saskatoon, Aug 19, 2021

Dear Prof. Koji Miwa, Chair of J-PARC Hadron Hall Users' Association,

Re: Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC

The hadron facility at J-PARC is unique in the world in that it offers a venue for the experimentalists to carryout precision measurements to serve as valuable testing grounds of hadron physics models of structures and symmetries.

It is no exaggeration to say that the activities at the J-PARC Hadron Experimental Facility are well acknowledged in particle, hadron, and nuclear physics, and related fields. The projects conducted at J-PARC are of importance for international hadron physics community and can benefit from further support of the J-PARC organization and world-wide community. The proposed Hadron Experimental Facility Extension Project at J-PARC, and the activities of HUA for the project, when implemented, will enhance their value significantly. This letter is to express my strong support and wish them great success in the new project.

Sincerely

Dr. C. Rangacharyulu

Professor of Physics and Engineering Physics

PENNSTATE

Department of Physics

Mark Strikman
104 Davey Laboratory
University Park PA 16802
U.S.A.

Tel: +1 (814) 883-6611
FAX: +1 (814) 865-3604
E-mail: mxs43@psu.edu

August 25, 2021

Professor Koji Miwa,
Chair of J-PARC Hadron Hall Users' Association,

Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC

I am well aware of the the pioneering activities at the J-PARC Hadron Experimental Facility in the fields of particle and hadronic and nuclear physics. They are nicely complemented by the experimental activities at the high energy electron TJNAF facility, planned research the future FAIR facility in Germany, studies of the resonance production at LHCb. The proposed Hadron Experimental Facility Extension Project at J-PARC, and, activities of HUA for the project add in important way to the spectroscopy studies. They would add another important component - investigation of the interplay between soft and hard physics in a variety of reactions. Especially noteworthy are exclusive reactions with production of charm baryon and anticharm meson and exclusive Drell- Yan production in high energy pion (kaon) induced processes. Complementary of these studies and studies exclusive electron induced reactions are well recognized by the world-wide QCD community.

Overall, I very strongly support the the Hadron Experimental Facility Extension Project and wish it a speedy progress.

.

Strikman

Mark Strikman
Distinguished Professor of Physics

---------- The Supporting Letter ------

Dear Prof. Koji Miwa, Chair of J-PARC Hadron Hall Users' Association!

The J-PARC Hadron Experimental Facility is the research center of world significance for the study of nuclear, hadron and particle physics. The new proposal for the Extension of the J-PARC Hadron Experimental Facility will allow experimental studies of such topical issues of modern hadron Physics as:

(i) central NN interactions (as well as the lightest nuclei interactions) at small impact parameters (less than 0.4 Fm) and the energy region (c.m.) from few GeV up to 10 GeV, i.e. in the Non-Perturbative QCD region;
(ii) the interaction of hadrons containing strange quarks;
(iii) the role of spin-dependent forces in high-density hadronic matter, as well as
(iv) problems of baryon spectroscopy.

On top of this, the study of high-density hadronic matter is a special interest for further experiments at the NICA collider constructing at JINR, Dubna.

Obviously, experiments conducted at J-PARC should be supported by the world-wide community as the internationally important projects.

We strongly support the Hadron Experimental Facility Extension Project at J-PARC and activities of HUA for the project. We believe in a further success in the new project.

Sincerely yours,

From our team at LHEP of JINR,

Eugene A. Strokovsky, Doctor of science, Professor,

Joint Institute for Nuclear Research, Dubna, Russia,

Laboratory of High Energy Physics (position: Head of the Division 2: physics at the Nuclotron beams),

and RCNP of the Osaka University, Specially Appointed Professor;

and

Alexander Averjanov, scientist,

Joint Institute for Nuclear Research, Dubna, Russia,

Laboratory of High Energy Physics (position: scientist).

23.08.2021

Dear Prof. Koji Miwa, Chair of J-PARC Hadron Hall Users' Association,

The J-PARC Hadron Experimental Facility is research center of world significance for the study of nuclear, hadron and particle physics. The new proposal for the Extension of the J-PARC Hadron Experimental Facility will allow studies of such topical issues of modern hadron Physics, as the interaction of hadrons containing strange quarks, the role of spin-dependent forces in high-density hadronic matter, as well as problems of baryon spectroscopy. The study of high-density hadronic matter is a special interest for further experiments at the NICA collider constructing at JINR, Dubna.
Obviously, experiments conducted at J-PARC should be supported by the the world-wide community as an internationally important projects.
It would be our great pleasure to strongly support the Hadron Experimental Facility Extension Project at J-PARC, and, activities of HUA for the project.
We believe in a further success in the new project.

Sincerely yours,
Krivenkov Dmitrii, PhD,
20.08.2021
Joint Institute for Nuclear Research, Dubna, Russia.
Laboratory of High Energy Physics, position - head of sector.

Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC

August 26, 2021

Dear Professor Koji Miwa, Chair of J-PARC Hadron Hall Users' Association,

We, the KOTO collaboration, appreciates the effort by the task force under the J-PARC Hadron Hall Users' Association to promote the hadron experimental facility extension project. We have been discussing the next generation experiment to measure the branching ratio of the $K_L^0 \to \pi^0 \nu\overline{\nu}$ decay, so-called KOTO step-2, which can be realized in the extended hadron hall. We hope the project can be realized in a timely manner and will provide us opportunities to conduct world-class experiments.

Sincerely,

Tadashi Nomura
on behalf of the KOTO collaboration

List of the staff members who signed up

Tadashi Nomura (Spokesperson; KEK/J-PARC, Japan)
Yau W. Wah (Co-spokesperson; University of Chicago, USA)
Yee Bob Hsiung (National Taiwan University, Republic of China)
Eun-Joo Kim (Jeonbuk National University, Republic of Korea)
Takeshi Komatsubara (KEK/J-PARC, Japan)
Katsushige Kotera (Osaka University, Japan)
Jong-won Lee (Korea University, Republic of Korea)
GeiYoub Lim (KEK/J-PARC, Japan)
Hajime Nanjo (Osaka University, Japan)
Koji Shiomi (KEK/J-PARC, Japan)
Yasuhisa Tajima (Yamagata University, Japan)
Yu-Chen Tung (National Taiwan University, Republic of China)
Hiroaki Watanabe (KEK/J-PARC, Japan)
Taku Yamanaka (Osaka University, Japan)

Physics Department

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for the U.S. Department of Energy

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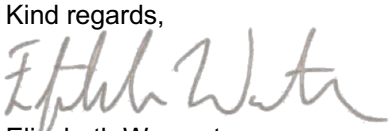
August 26, 2021

To Whom It May Concern:

I am following with interest the discussion of the Hadron Hall Extension and particularly the proposed KOTO-2 experiment. I think the extension is well-justified and anticipate that KOTO-2 will have the potential to make exciting discoveries and will make important contributions to high-energy physics.

I and several of my colleagues at Brookhaven National Lab would be interested in exploring the possibility of participating in KOTO-2 if this program goes forward.

Kind regards,



Elizabeth Worcester
Physicist, BNL

Prof. Koji Miwa
Tohoku University,
Chair of J-PARC
Hadron Hall
Users' Association
(HUA)

Prof. Jung Keun Ahn
Department of Physics
Korea University
Seoul, 02841, Korea
Tel:+82-2-3290-3093
email: ahnjk@korea.ac.kr

August 27, 2021

Letter of Support
for the Hadron Experimental Facility Extension Project at J-PARC

Dear Koji,

We are pleased to learn that the Hadron Experimental Facility Extension Project is being proposed to build new secondary beam lines for nuclear, hadron, and particle physics experiments. The experimental activities at the J-PARC Hadron Experimental Facility have played significant roles in particle, hadron, nuclear physics, and their related fields. In particular, the hadron/nuclear physics experiments conducted there have been internationally essential and supported by the worldwide community.

We will be proposing a new experiment with the K1.1 beam line to study low-energy $\overline{K}N$ and KN interactions. This new experiment includes a search for the pentaquark state Θ^+ in $K^+d \rightarrow K^0pp$ reaction with the Hyperon Spectrometer. We will also be heavily involved in the K1.1 physics program, which currently includes high precision hypernuclear spectroscopy and high-quality hyperon-nucleon scattering experiments.

It is our great pleasure to support the Hadron Experimental Facility Extension Project at J-PARC, and the activities of HUA for proposing the project. We believe the project, including the newly proposed experiments, is pretty compelling, and we strongly desire early realization of the project.

Jung Keun Ahn

May 12, 2021

FROM: Dr. Pete Markowitz
TO: J-PARC Hadron Hall Users' Association
RE: Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC

Dear Prof. Koji Miwa, Chair of J-PARC Hadron Hall Users' Association,

The activities at the J-PARC Hadron Experimental Facility are important, well-acknowledged and essential for our understanding in the fields of particle, hadron, and nuclear physics, as well as their related fields. The impact of current and planned future measurements should not be under-estimated. In particular, we believe that the projects conducted at J-PARC are internationally at the forefront of the field and need further support from the world-wide community. For that reason, it would be our great pleasure to strongly support the Hadron Experimental Facility Extension Project at J-PARC, and, activities of HUA for the project. We hope for further success with the new project.

If I can be of further help, please let me know. I can be reached at 305-348- 1710 or markowit@fiu.edu.

Sincerely

Dr. Pete E.C. Markowitz
Assistant Dean of the Honors College and Professor of Physics

ÖAW AUSTRIAN ACADEMY OF SCIENCES

SMI – STEFAN MEYER INSTITUTE FOR SUBATOMIC PHYSICS

Supporting Letter for the Hadron Experimental Facility
Extension Project at J-PARC

Vienna August 18, 2021

Dear Prof. Koji Miwa, Chair of J-PARC Hadron Hall Users' Association,

We known that the activities at the J-PARC Hadron Experimental Facility are well acknowledged in particle, hadron, nuclear physics and related fields. In particular, the projects conducted at J-PARC delivering important contributions to the world-wide effort in hadron physics. Therefore, further strong international support of these and upcoming experiments is essential.

It is our great pleasure to strongly support the Hadron Experimental Facility Extension Project at J-PARC, and activities of HUA for the project.

We hope the project will be realised and we are looking forward to very successful conducted experiments.

Sincerely

Prof. Johann Zmeskal

Prof. Eberhard Widmann
Prof. Johann Marton

STEFAN MEYER-INSTITUT
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JOHANNES GUTENBERG
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Fachbereich
Physik, Mathematik und Informatik
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achenbach@uni-mainz.de

August 19, 2021

Supporting Letter
for the Hadron Experimental Facility Extension Project at J-PARC

To: Prof. Koji Miwa (Tohoku University),
Chair of J-PARC Hadron Hall Users' Association (HUA)

Dear Koji,

The experimental activities at the J-PARC Hadron Experimental Facility have played significant roles in particle, hadron, and nuclear physics as well as their related fields. In particular, the hadron/nuclear physics experiments conducted there have been internationally important and supported by the world-wide community.

It is my great pleasure to support the Hadron Experimental Facility Extension Project at J-PARC, and the activities of HUA for proposing the project. I believe the project including the newly-proposed experiments are quite compelling and I strongly desire early realization of the project.

In Mainz, we have developed a broad knowledge base in strangeness and hypernuclear physics. In the last decade, a group working at the MAMI electron accelerator was setting up the Kaos spectrometer for performing strangeness and hypernuclear physics and successful experiments were run in the following years. During this time, a strong cooperation between the groups in Mainz and at Tohoku University was established, students were participating in experiments abroad and common publications were written. In addition, the two groups cooperated at hypernuclear electroproduction experiments at Jefferson Lab in the US. Secondly, a cooperation exists between the PANDA hypernuclear physics group at the Helmholtz Institute Mainz (HIM) and the J-PARC groups performing studies on double hypernuclei. A strong link to the group at Kyoto University exists. This research area has evolved during the last years and the Hadron Experimental Facility Extension Project at J-PARC is a natural, necessary, and timely future direction. I am confident that the strangeness physics groups in Mainz will participate strongly to and benefit greatly from the realization of the project.

Sincerely,

August 19, 2021, Prof. Patrick Achenbach, Johannes Gutenberg University Mainz

GOETHE UNIVERSITÄT FRANKFURT AM MAIN

Goethe-University | 60629 Frankfurt am Main
Depeartment of Physics | Institute for Nuclear Physics

To:
Prof. Koji Miwa (Tohoku University)
Chair of J-PARC Hadron Hall Users' Association (HUA)

Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC

Dear Koji,

the experimental activities at the J-PARC Hadron Experimental Facility have played significant roles in particle, hadron, and nuclear physics as well as their related fields. In particular, the hadron and nuclear physics experiments conducted there have been internationally important and supported by the world-wide community.

It is our great pleasure to support the Hadron Experimental Facility Extension Project at J-PARC, and the activities of HUA for proposing the project. We believe the project including the newly-proposed experiments are quite compelling and we strongly desire early realization of the project.

There are unique measurements proposed at J-PARC, that will provide direct inside where often modelling or assumptions are needed nowadays.
Especially, the scattering experiments planned to measure the Σ^--p interaction are absolutely unique since many experiments, e.g. ALICE at LHC, have no possibilty to reconstruct the Σ^- directly. Furthermore, the precison measurements on the production of hypernuclei will be suitable to complete our current understanding.

Sincerely,

(Dr. Benjamin Dönigus)

Member of the ALICE Collaboration at CERN LHC
Physics Analysis Group Convenor “Nuclei and Exotica” of ALICE (2014-2019)
Technical Coordinator of the ALICE Transition Radiation Detector (since 2018)
Personal focus on: Production of loosely bound objects in high-energy collisions and detector physics

Collaborators:
Members of the ALICE Collaboration
Horst Stöcker, Frankfurt Institute of Advanced Studies (FIAS)
Peter Braun-Munzinger, Extrem Matter Institute (EMMI), GSI
Stefania Bufalino, Politecnico of Turin, Department of App. Science & Technology

August 26th 2021

Department of Physics

Institute for Nuclear Physics

Dr. Benjamin Dönigus

Lecturer

Visiting adress
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Istituto Nazionale di Fisica Nucleare
SEZIONE DI TORINO

To: Prof. Koji Miwa (Tohoku University)
Chair of J-PARC Hadron Hall Users' Association (HUA)

Subject: **Letter supporting the Hadron Experimental Facility Extension Project at J-PARC**

Turin, August 31, 2021

Dear Koji,

the experimental activities at the J-PARC Hadron Experimental Facility have been playing significant roles in particle, hadron, and nuclear physics as well as in their related fields. In particular, the hadron/nuclear physics experiments carried out in this laboratory have been of international relevance and raised the interest of a world-wide community.

It is our great pleasure to support the Hadron Experimental Facility Extension Project at J-PARC, and the efforts of HUA for proposing the project. We believe that this initiative, including the newly proposed experiments, is quite compelling and we eagerly wish for its timely realization.

The research Group in Turin enthusiastically looks forward to the important opportunity offered by the future availability of new facilities dedicated to hadron physics.
As far as our specific research activity is concerned, it would be of paramount importance to continue and to deepen the studies currently in progress on strangeness nuclear physics, in the framework of the already well established collaborations with Japanese colleagues.
In particular, the unique and excellent new beam quality makes promising the exploitation of the (π^-,K^0) reaction, never used before, in order to perform a complete investigation of the weak decay process of several neutron-rich Λ-hypernuclei.

Sincerely,

Alessandro Feliciello,
INFN – Sezione di Torino,
senior staff researcher,
spokesperson of the INFN Collaboration ULYSSES

Michelangelo Agnello,
Department of Applied Science and Technology, Politecnico di Torino and
INFN – Sezione di Torino,
Full Professor

Elena Botta,
Physics Department, Turin University and INFN – Sezione di Torino,
Associate Professor

Stefania Bufalino,
Department of Applied Science and Technology, Politecnico di Torino and
INFN – Sezione di Torino,
Associate Professor

Daniela Calvo,
INFN – Sezione di Torino,
senior staff researcher

Alessandra Filippi,
INFN – Sezione di Torino,
senior staff researcher

GOETHE
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FRANKFURT AM MAIN

Goethe-University | 60438 Frankfurt am Main
Faculty of Physics

To:
Prof. Koji Miwa (Tohoku University)

Chair of J-PARC
Hadron Hall Users' Association (HUA)

August 19th, 2021

Fachbereich 13
Physik
Institut für Kernphysik

Prof. Dr. Christoph Blume
Campus Riedberg/Physik-Gebäude
Max-von-Laue-Str. 1
60438 Frankfurt am Main
Telefon +49 (0)69 798 47060
Telefax +49 (0)69 798 47046
blume@ikf.uni-frankfurt.de
www.uni-frankfurt.de

Title: Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC

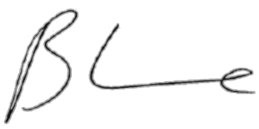
Dear Koji,

The experimental activities at the J-PARC Hadron Experimental Facility have played significant roles in particle, hadron, and nuclear physics as well as their related fields. In particular, the hadron/nuclear physics experiments conducted there have been internationally important and supported by the world-wide community.

It is our great pleasure to support the Hadron Experimental Facility Extension Project at J-PARC, and the activities of HUA for proposing the project. We believe the project including the newly-proposed experiments is quite compelling and we strongly desire an early realization of the project.

The proposed experiments, in particular on hypernuclei and the interactions of strange baryons, will be very important for the understanding of the properties of neutron stars. They will be a decisive complement to the physics program at other facilities, such as FAIR and NICA, and will provide indispensable data necessary for the interpretation of future measurements.

Sincerely,



Prof. Dr. Christoph Blume

to Prof. Koji Miwa (Tohoku University),
Chair of J-PARC Hadron Hall Users' Association (HUA)

Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC

Dear Koji,

The experimental activities at the J-PARC Hadron Experimental Facility have played significant roles in particle, hadron, and nuclear physics as well as their related fields. In particular, the hadron/nuclear physics experiments conducted there have been internationally important and supported by the world-wide community.

With great pride we may say that we participated in a whole series of the experiments conducted in Hadron Hall (E19, E10, E13, E05 and E40)

It is our great pleasure to support the Hadron Experimental Facility Extension Project at J-PARC, and the activities of HUA for proposing the project. We believe the project including the newly-proposed experiments are quite compelling and we strongly desire early realization of the project.

Sincerely,
Zviadi Tsamalaidze, head of the department LNP JINR

Petr Evtoukhovitch, senior researcher LNP JINR

20.08.2021

差出人： **Hiroyuki Noumi** noumi@rcnp.osaka-u.ac.jp
件名： Fwd: Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC
日付： 2021年8月18日 15:30
宛先： Miwa miwa9@lambda.phys.tohoku.ac.jp、 Fuminori Sakuma sakuma@ribf.riken.jp

HN

---------- Forwarded message ---------
From: **Wen-Chen Chang** <changwc@phys.sinica.edu.tw>
Date: 2021年8月18日(水) 15:23
Subject: Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC
To: Hiroyuki Noumi <noumi@rcnp.osaka-u.ac.jp>
Cc: Wen-Chen Chang <changwc@phys.sinica.edu.tw>

Dear Prof. Koji Miwa,

The activities at the J-PARC Hadron Experimental Facility are well appreciated in particle, hadron, and nuclear physics, and their related fields. In particular, we understand that their projects conducted at J-PARC are internationally important and need further support from the world-wide community. We are very much delighted to show our strong support of the Hadron Experimental Facility Extension Project at J-PARC, and, activities of HUA for the project. We greatly look forward to a further success of the new project.

Sincerely yours,

Wen-Chen Chang

Institute of Physics, Academia Sinica, Taiwan
Research fellow
2021/8/18

==========
Wen-Chen Chang
Phone(O): 886-2-2789-6794 E-mail: changwc@phys.sinica.edu.tw
Fax(O) : 886-2-2783-4187 URL:https://goo.gl/CahZnc
==========

Technische Universität München | Arcisstraße 21 | 80333 München

Prof. Koji Miwa (Tohoku University)
Chair of J-PARC Hadron Hall Users
Association (HUA)

Place (Munich), 29. August 2021

Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC

Dear Koji,

I'm a professor in hadron physics at the Technische Universität München and an active member of the ALICE collaboration at the CERN-LHC and I would like herewith to strongly support the experimental facility extension project at J-PARC. The experimental activities at the J-PARC Hadron Experimental Facility have played and are playing a unique role in particle, hadron, and nuclear physics. In particular, the hadron/nuclear physics experiments conducted there have been internationally important and supported by the world-wide community.

The quest of the detailed understanding of the strong interaction starting from first principles and extended to strange and charmed quarks represents today the frontier of nuclear physics and provides important implications for astrophysics as well. The ongoing experiments at J-PARC provide unique experimental methodologies to address unsolved problems in the field and pave a new avenue for nuclear physics extended to the strange and charmed sector. Along with emerging new fields linked to solid state and biophysics, the long-standing nuclear physics field holds the foundations for the understanding of the building blocks or ordinary and exotic forms of matter and hence experimental effort in this direction is of capital importance not only the discipline of strong interaction itself but also for neighboring fields of research.

It is hence not only my pleasure but also my duty as a scientist to support the Hadron Experimental Facility Extension Project at J-PARC, and the activities of HUA for proposing the project. I believe that the project including the newly-proposed experiments are quite compelling and extremely competitive in their originality and technological realization. This means that the proposed extension of the experimental facility and planned experiments will be also capable to attract young and talented scientists to our field and motivate further theoretical studies world-wide.

The experimental program on hadron physics I'm leading at the LHC is deeply entangled to current and future experiments at J-PARC. The complementarity of our approaches provided fundamental contributions in the field of hadron physics in recent years and I'm looking forward to the future common challenges.

Technische Universität München
Physik Department
Fachgebiet ‚Dense and Strange Hadronic Matter'

Prof. Dr. rer. nat.
Laura Fabbietti
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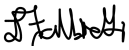
85748 Garching

Tel. +49 89 289 12 431
Fax +49 89 289 12 435

laura.fabbietti@ph.tum.de
https://www.denseandstrange.ph.tum.de/

Sincerely,



Prof. Dr. Laura Fabbietti

Istituto Nazionale di Fisica Nucleare
www.lnf.infn.it

Dr. Catalina Curceanu
tel. + 39 06 9403 2321
fax + 39 06 9403 2559
email: Catalina.Curceanu@lnf.infn.it

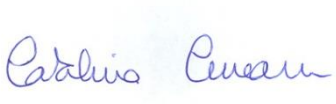
Frascati, 17th August 2021

Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC

Dear Prof. Koji Miwa, Chair of J-PARC Hadron Hall Users' Association,

For more than 20 years the Italian and Japanese teams were collaborating for strangeness physics studies, both in Italy and in Japan, at the complementary facilities DAFNE (in Italy) and J-PARC (in Japan).
In this context I am the spokesperson of the SIDDHARTA-2 Collaboration performing strangeness studies at DAFNE and am also leading the Italian LNF-INFN group who is participating at various experiments at J-PARC hadron hall, among which E15, E57 and E62.
The results obtained at the unique J-PARC Hadron Experimental Facility are very relevant and are broadly acknowledged by the international community. These results, especially those obtained in the last several years for studies involving strangeness nuclear interactions, are extremely important in particle and nuclear physics, as well as in astrophysics (Equation of State of neutron stars, a hot issue, still open).
We believe that the projects conducted at J-PARC are internationally important and, in this context and with great pleasure we strongly support the Hadron Experimental Facility Extension Project at J-PARC, and activities of HUA for the project.
If this extension project will be granted, we plan to participate in the experiments and researches which will be conducted there in the future.

Sincerely,
Dr. Catalina Curceanu



INFN-LNF
Spokesperson of the SIDDHARTA-2 collaboration and leader of team of LNF-INFN participating to J-PARC experiments

差出人: **Samanta, Chhanda** samantac@vmi.edu
件名: Hadron Facility Extension Project, and/or the HIHR/K1.1 program
日付: 2021年8月25日 0:18
宛先: miwa9@lambda.phys.tohoku.ac.jp
CC: tamura@lambda.phys.tohoku.ac.jp、 nue@lambda.phys.tohoku.ac.jp

CS

August 24, 2021

Prof. Koji Miwa (Tohoku University),
Chair of J-PARC Hadron Hall Users' Association.

Dear Miwa-san,

I have been working in the field of Hypernuclei (both theory and experiment) for a long time. Hypernuclear mass measurements can provide important information on the hyperon-nucleon and hyperon-hyperon force that is essential for understanding the mass and radius of high density neutron stars as well as primordial strange stars. Incidentally, a mathematical formula, known as the "Samanta Formula", can predict the binding energy of a hypernucleus over an wide mass range.

I am a collaborator of several hypernuclear projects at the Jefferson Lab, USA. In the past I had the privilege of working at J-PARC and RCNP with my esteemed Japanese colleagues. I am impressed witnessing how the progress of science has been backed by the progress of technology in Japan.

I fully support the Hadron Facility Extension Project, and/or the HIHR/K1.1 program as it would add a valuable route for pioneering research work in the field of hypernuclei.

All the best.

Chhanda Samanta

Chhanda Samanta, PHD
Col. & Professor, Dept. of Physics & Astronomy
Virginia Military Institute, Lexington, VA 24450, USA
Ph: 001-(540) 464-7506 FAX: 001-(540) 464-7767
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https://scholar.google.com/citations?user=ufCkn8AAAAAJ&hl=en

Chhanda Samanta - Google Scholar

scholar.google.com

Professor, VMI - Cited by 2,400 - Physics

Carnegie Mellon University

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August 24, 2021

Prof. Koji Miwa
Tohoku University
Chair of J-PARC Hadron Hall Users' Association (HUA)

Dear Professor Miwa-san,

Allow me to express my strong support for the Hadron Experimental Facility Extension Project at J-PARC, in particular the experiments aimed at refining our understanding of hypernuclear states across the periodic table.

I have been associated with experiments at the old BNL/AGS hypernuclear physics program in the 1980's and 1990's, as well as strangeness physics using electromagnetic probes at Jefferson Lab from the 1990's until today. I have enjoyed the collaboration with many Japanese colleagues who have been working at the same facilities. My strongest associations were with Ken Imai-san, Toru Iijima-san (now KEK/Belle) and Hiro Tamura-san on the BNL/AGS D-line experiments searching for the hypothetical H particle. I have visited and tremendously enjoyed my visits to J-PARC to interact with your colleagues there and to see the excitement generated by their work.

It is clear to me that hadronic beams are the best way to explore hypernuclear environments, unlike the electromagnetic probes used at Jefferson Lab. My current research is focused on electromagnetic probes, but I follow development in the hadronic domain closely in the literature. You have a unique position at J-PARC to maintain world leadership in the field of hypernuclear physics using the existing beam lines but also by building out your capabilities in the hadron hall. From what I read about the HIHR and K1.1 facilities, it looks like you have an excellent chance to keep this exciting research field moving. The connection of hypernuclear phenomenology and theory to the physics of dense stellar dynamics is highly interesting to everyone worldwide. Progress in understanding the YN interaction is central to this effort, and this is where J-PARC stands out. I support early realization of the project.

Sincerely Yours,

Reinhard Schumacher

Reinhard Schumacher
Professor of Physics

Instituto de Física
Universidade de São Paulo

Prof. Alberto Martínez Torres,
Departamento de Física Nuclear,
Instituto de Física, Universidade de São Paulo, Rua do Matão 1371, CEP 05508-090, São Paulo, Brasil

Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC

Dear Prof. Koji Miwa, Chair of J-PARC Hadron Hall Users' Association,

It is a pleasure to be writing a letter supporting the hadron experimental facility extension project at J-PARC. It is well known that the activities at the J-PARC Hadron Experimental Facility are very important for the progress in particle, hadron, and nuclear physics research. The projects conducted at J-PARC have a high international impact on the world-wide hadron physics studies and are not only of interest to the physics community, but to science. I gladly support the Hadron Experimental Facility Extension Project at J-PARC and I am certain about its success.

São Paulo, 19 AUGUST 2021

ALBERTO MARTÍNEZ TORRES

Instituto de Física da USP
Depto. de Física Nuclear

UNIVERSITY OF
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Maryland Center for Fundamental Physics

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cohen@physics.umd.edu

Dear Prof. Koji Miwa, Chair of J-PARC Hadron Hall Users' Association,

I write in strong support of the Hadron Experimental Facility Extension Project at J-PARC.

I have been working in hadronic physics as a theorist for more than three and a half decades. The health of the field depends on new high-quality experimental results which in turn depends on first-rate experimental facilities such as those found at Jefferson Lab in the United States and at J-Park in Japan. I have followed the research at the J-PARC Hadron Experimental Facility and they are clearly acknowledged as being of great significance to the hadron physics community, and have clear and fundamental overlaps with nuclear physics, particle physics and related fields.

Given this situation, I firmly believe that the projects conducted at J-PARC are of importance internationally and should be fully supported by the world-wide hadronic physics community.

Thus, I strongly support the Hadron Experimental Facility Extension Project at J-PARC and hope for success in the new project.

Sincerely

Sincerely,

Thomas D. Cohen
Professor
Associate Chair for Graduate Studies

差出人: **Craig D. Roberts** cdroberts.inp@gmail.com
件名: Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC
日付: 2021年8月24日 12:08
宛先: takizawa@ac.shoyaku.ac.jp
CC: cdroberts cdroberts@nju.edu.cn

To: Prof. Koji Miwa
Chair of J-PARC Hadron Hall Users' Association,

Dear Prof. Miwa

The research team at the Nanjing University Institute for Nonperturbative Physics (INP) is keenly interested in activities at the J-PARC Hadron Experimental Facility, which are widely acknowledged as providing world-wide leadership in particle, hadron, and nuclear physics, and their related fields.

In particular, we believe that their projects conducted at J-PARC are of great international importance and significance. Consequently, they would benefit from further support from the world-wide community.

I am therefore pleased to offer the strong backing of NJU-INP and its affiliates to the Hadron Experimental Facility Extension Project at J-PARC.

We wish this new project a very successful future.

Yours sincerely,
Craig Roberts for the NJU INP

--

Craig Roberts

InternationalDistinguished Professor - School of Physics & Head - Institute for NonperturbativePhysics

NanjingUniversity, 22 Hankou Rd, Gulou District
Nanjing, Jiangsu 210093,China

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Institute of Physics Belgrade
Pregrevica 118, Zemun
11080 Belgrade, Serbia
19th August 2021

Prof. Koji Miwa,
Chair of J-PARC Hadron Hall Users' Association
Tohoku University

Title: Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC

Dear Prof. Koji Miwa,

We, the undersigned, have known that the activities at the J-PARC Hadron Experimental Facility are well acknowledged in particle, hadron, and nuclear physics, and their related fields. In particular, we believe that the projects conducted at J-PARC are internationally important and need further support from the world-wide community. It would be my great pleasure to strongly support the Hadron Experimental Facility Extension Project at J-PARC. I wish J-PARC staff and scientists further success in the new project.

Sincerely

Veljko Dmitrašinović,
(dmitrasin@ipb.ac.rs Full Research Professor at the Institute of Physics Belgrade - Elementary Particle Physics Group).

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[Professor Dr. E. Epelbaum Theoretische Physik II]
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http://www.tp2.rub.de

To:
Prof. Koji Miwa (Tohoku University)
Chair of J-PARC Hadron Hall Users' Association (HUA)

Ihr Zeichen | Ihre Nachricht vom	**Unser Zeichen | Unsere Nachricht vom**	**Datum**
	Supporting Letter	24. August 2021

Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC

Dear Koji,

The experimental activities at the J-PARC Hadron Experimental Facility have played significant roles in particle, hadron, and nuclear physics as well as their related fields. In particular, the hadron/nuclear physics experiments conducted there have been internationally important and supported by the world-wide community.

It is our great pleasure to support the Hadron Experimental Facility Extension Project at J-PARC, and the activities of HUA for proposing the project. We believe the project, including the newly-proposed experiments, are quite compelling and we strongly desire early realization of the project.

Sincerely,

Prof. Dr. Evgeny Epelbaum
Chair in Theoretical Physics at Ruhr University Bochum

差出人: <fkguo@itp.ac.cn>

件名: Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC

日付: 2021年8月19日 22:29:24 JST

宛先: <hosaka@rcnp.osaka-u.ac.jp>

CC: 邹冰松 <zoubs@itp.ac.cn>

Dear Prof. Koji Miwa, Chair of J-PARC Hadron Hall Users' Association,

We have known that the activities at the J-PARC Hadron Experimental Facility are well acknowledged in particle, hadron, and nuclear physics, and their related fields, and have made well-recognized important contributions. In particular, we believe that their projects conducted at J-PARC are internationally important and need further support from the world-wide community. It would be our great pleasure to strongly support the Hadron Experimental Facility Extension Project at J-PARC. I hope a further success in the new project.

Sincerely yours,
Feng-Kun Guo (Professor, Institute of Theoretical Physics, Chinese Academy of Sciences)
Bing-Song Zou (Professor, Institute of Theoretical Physics, Chinese Academy of Sciences)

August 19, 2021

Dr. Feng-Kun Guo
Professor
Institute of Theoretical Physics, CAS
Zhong Guan Cun East Street 55
100190 Beijing, China

Prof. Koji Miwa
Tohoku University
Chair of J-PARC Hadron Hall Users' Association (HUA)
miwa9@lambda.phys.tohoku.ac.jp

24 August 2021

Re: Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC

Dear Koji,

The experimental program carried out at the J-PARC Hadron Experimental Facility has played a significant role in particle, hadron, and nuclear physics as well as in their related fields. In particular, the hadron/nuclear physics experiments conducted at J-PARC have made a substantial impact internationally and have been supported by the world-wide community.

It is with great pleasure that we write to support the Hadron Experimental Facility Extension Project at J-PARC, and we applaud the role of the HUA in proposing the project. This project, including the proposed experiments, is quite compelling, and we urge an early realization of the project.

The proposed HIHR/K1.1 beam line is of utmost importance to making progress in understanding the structure of neutron stars. To that end it is essential that we have precision hypernuclear data that vet our models. The effort required to solve what you have labeled as the “hyperon puzzle” is enormous. You are proposing to create the laboratory data base required to extrapolate beyond nuclear densities to solve the "neutron star hyperon puzzle". The extensive NN data base and myriad nuclear spectroscopic data have established that sophisticated two-body nucleon force models cannot alone provide the basis for robust Equation of State (EoS) models of nuclear matter at high density. In non-relativistic Hamiltonian models, the addition of three-nucleon forces is required to generate EoS models that support neutron stars of more than 2 solar masses (and having a radius of the order of 10 km), which have now been observed. However, in such dense neutron matter hyperons are certain to appear, which will soften the EoS. Model calculations confirm that idea when two-body hyperon-nucleon forces are included, strongly suggesting that our rudimentary

hyperon-nucleon force models are incomplete. Indeed, hyperon-nucleon scattering data are sparse as are hypernuclear spectroscopic data. Resolving the neutron star hyperon puzzle requires extensive hyperon-nucleon scattering data as well as hypernuclear spectroscopic data, so that our hyperon-nucleon force models can be extended to include 3-body hyperon-nucleon forces just as nucleon-nucleon force models were expanded as the nucleon-nucleon scattering data base and nuclear spectroscopic data were made precise by extensive experimental measurements. J-PARC can do for hypernuclear physics that which took decades for the world to accomplish for conventional nuclear physics.

To be clear, the hyperon-nucleon (YN) scattering program at higher energies is essential to modeling the Equation of State that one needs to model the structure of neutron stars. It is only through such investigations that we can develop knowledge of the short-range properties of the YN interaction. Without that knowledge we cannot accurately model the Equation of State at the matter densities which we can probe in the laboratory. The matter density within a neutron star can be several times the matter density that we can explore in the laboratory. Our Equation of State from laboratory measurements must extrapolate a significant "distance" to neutron star matter. Thus, it is imperative that we understand as much as feasible about nuclear matter which we can investigate in the laboratory. Your experimental program to investigate hypernuclear structure as a function of A up to ^{208}Pb will play a crucial role.

Let us turn to the light hypernuclei and the need for precision YN scattering data. A data base for YN scattering comparable to that which exists for NN scattering is essential to provide the underpinning or basis for our understanding of the YN interaction that will permit robust modeling of hypernuclei including YNN forces, just as we are now able to model nuclei in the conventional, strangeness = 0 domain. Because we have no 2-body YN bound states, the hypertriton will play a role in the Lambda-nucleon (LN) sector similar to that of the deuteron in the NN sector. Therefore, it is important that we measure precisely the ^3_LH Lambda-separation energy and the poles of the T=0 and T=1 excited states. Those observables along with the LN scattering lengths will constrain the YN interaction models just as the deuteron binding energy and the pp, nn, and np spin-singlet scattering lengths constrain the NN interaction models. Connection to such work at JLab as measuring the Lnn observables will be necessary to paint a full picture of the A=3 YNN physics. Modeling of the A=4 and A=5 Lambda-hypernuclei will be essential to our beginning to

understand the YNN interaction within a given hyperon-nucleon force model. (This is analogous to the path taken in the NN+NNN domain to constrain the T=1/2 NNN interaction by calculating the A=3 and A=4 nuclear binding energies. One is able to constrain the longer-range attractive component of the 3-body force.) Thus, precision experimental measurements of the A=4 and A=5 Lambda-hypernuclei bound state energies are essential to solving the "hyperon puzzle".

We wish you every success in bringing this project to fruition.

Sincerely,

Benjamin F. Gibson
Los Alamos National Laboratory
Los Alamos, NM, USA
and
Editor, Physical Review C

Iraj R. Afnan
Flinders University
Adelaide, SA, Australia

CC: Hiro Tamura tamura@lambda.phys.tohoku.ac.jp
Nue Nakamura nue@lambda.phys.tohoku.ac.jp

差出人： **Haidenbauer, Johann** j.haidenbauer@fz-juelich.de
件名： Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC
日付： 2021年8月25日 16:00
宛先： Koji Miwa miwa9@lambda.phys.tohoku.ac.jp

JH

Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC

To Prof. Koji Miwa (Tohoku University), Chair of J-PARC Hadron Hall Users' Association (HUA)

August 24, 2021

Dear Koji,

The experimental activities at the J-PARC Hadron Experimental Facility have played significant roles in particle, hadron, and nuclear physics as well as their related fields. In particular, the hadron/nuclear physics experiments conducted there have been internationally important and supported by the world-wide community.

It is our great pleasure to support the Hadron Experimental Facility Extension Project at J-PARC, and the activities of HUA for proposing the project. We believe the project including the newly-proposed experiments are quite compelling and we strongly desire early realization of the project.

Of specific interest to our group in Bonn/Jülich is certainly the planned HIHR/K1.1 program. In particular, we expect that the measurements to be performed at the K1.1 beam-line are going to revolutionize our knowledge on the Lambda-proton interaction at low and medium energies. While so far only integrated cross sections (and with low statistics) are available, the proposed experiment will allow access to differential observables and even to spin-dependent quantities. Such observables pave the way for gaining a much better insight into the dynamics of the Lambda-proton interaction. They will be rather helpful for achieving a substantial improvement of the description of the hyperon-nucleon forces in terms of chiral effective field theory, a model-independent approach to baryon-baryon forces employed by our group.

Also the HIHR program is very interesting for us. We are happy to see that this experiment is designed to cover a rather wide range of Lambda hypernuclei including also fairly light systems with atomic numbers in the range of A=6-9. Such light hypernuclei are amenable to the so-called ab initio treatment that our group pursues for some time, which allows a principally exact evaluation of the properties of those hypernuclei directly from the underlying (hyperon-nucleon) two-body forces as well as with inclusion of possible (hyperon-nucleon-nucleon) three-body forces.

We consider covering also heavier hypernuclei as an important additional aspect of the program. This data will provide additional constraints on the hyperon-nucleon and hyperon-nucleon-nucleon interactions at higher densities that are important for a reliable application to hyperonic nuclear matter.

Sincerely,

Prof. Ulf-G. Meißner
HISKP and BCTP
University of Bonn
D-53115 Bonn
and
Institute for Advanced Simulation
Forschungszentrum Jülich GmbH
D-52425 Jülich

Dr. Johann Haidenbauer
Dr. Hoai Le
Dr. Andreas Nogga
Institute for Advanced Simulation
Forschungszentrum Jülich GmbH
D-52425 Jülich

Forschungszentrum Juelich GmbH

Ben Gibson　　7 月 12 日(月) 9:39

Dear Hiro, Koji, & Nue,

I have previously written about how important your program at J-PARC on the proposed HIHR/K1.1 beam line is to making progress in understanding the structure of neutron stars. To understand neutron stars it is essential that we have precision hypernuclear data that our models can reproduce. In listening to the discussions at the workshop last week, I wondered how well nonexperts in hypernuclear physics will understand the effort required to solve what you have labeled as the hyperon puzzle. It seems to me that you are trying to create the laboratory data base required to extrapolate beyond nuclear densities to solve the "neutron star hyperon puzzle". At least as I followed the presentations supporting the HIHR/K1.1 beam line program, one is saying: The extensive NN data base and myriad nuclear spectroscopic data have established that sophisticated two-body nucleon force models alone cannot alone provide the basis for robust Equation of State (EoS) models of nuclear matter at high density. In non-relativistic Hamiltonian models, the addition of three-nucleon forces is required to generate EoS models that support neutron stars of more than 2 solar masses (and having a radius of the order of 10 km), which have recently been observed. However, in such dense neutron matter hyperons are certain to appear, which will soften the EoS. Model calculations confirm that idea when two-body hyperon-nucleon forces are included, strongly suggesting that our rudimentary hyperon-nucleon force models are incomplete. Indeed, hyperon-nucleon scattering data are sparse as are hypernuclear spectroscopic data. Resolving the neutron star hyperon puzzle requires extensive hyperon-nucleon scattering data as well as hypernuclear spectroscopic data, so that our hyperon-nucleon force models can be extended to include 3-body hyperon-nucleon forces just as nucleon-nucleon force models were expanded as the nucleon-nucleon scattering data base and nuclear spectroscopic data were made precise by extensive experimental measurements. J-PARC can do for hypernuclear physics that which took decades for the world to accomplish for conventional nuclear physics.

Best regards,　Ben

Ben Gibson bfgibson@earthlink.net 2021/06/28 7:21

Dear Hiro, Koji, and Nue,

My apology for the delay in continuing the discussion of the importance of the "Physics at J-PARC

HIHR/K1.1 beam lines" program. The YN scattering program at higher energies is essential to modeling the Equation of State that one needs to think about the structure of neutron stars. It is only thru such investigations that we can develop knowledge of the short range properties of the YN interaction. Without that knowledge we cannot accurately model the Equation of State at the matter densities which we can probe in the laboratory. The matter density within a neutron star can be several times the matter density that we can explore in the laboratory. Our Equation of State from laboratory measurements must extrapolate a significant "distance" to neutron star matter. Thus, it is imperative that we understand as much as feasible about nuclear matter which we can investigate in the laboratory. Your experimental program to investigate hypernuclear structure as a function of A up to ^{208}Pb will play an important role.

Kind regards,

Ben

Vidana Isaac isaac.vidana@ct.infn.it　6 月 19 日(土) 15:43

To Satoshi, Koji, Hirokazu

Dear Hiro

Unfortunatelly. today I will only be able to attend the first talks, because I have a family committment. I am very sorry. I send you, however, my personal list of wishes for the hypenuclar EoS and particularly for the solution of the hyperon puzzle.

- More YN (hopefully also YY) scattering data (This is highly desireable)
- More & updated hypernuclear data (specially in medium?heavy hypernuclei)
- Measurements of multi-strange hypernuclei
- Study of light hypernuclei to determine the role of hyperonic TBFs

Others:
- Lattice QCD calculations
- Analysis of hyperon-hyperon correlations in HIC
- More astronomical data sensitive to the strangeness content of NS

Best regards

Isaac

Prof. Dr. Horst Lenske <horst.lenske@physik.uni-giessen.de>
6 月 17 日(木) 18:39

Dear Hiro, dear Nue, and Koji,

These are two impressive projects! The proposals are addressing two highly needed, important, and interesting experiments! Both experiments are on the forefront of nuclear research. They' ll give the great chance to enlarge tremendously and improve the data bases for YN interactions not only in free space but also in nuclei. The polarization measurements are clearly urgently needed in order to encircle the spin-dependent interaction terms. I wonder what kind of surprises will be detected…for example about the tensor interaction which for Lambda-n should be strongly suppressed according to our generally accepted expectations!

As you state correctly in the YA proposal, the whole sector of in-medium hyperon interactions is poorly understood – if at all! If goes further into the details, the picture behind YNN forces becomes a much richer and more divers structure: Since the Lambda does mit couple directly to the pion, the usual mechanism assumed as leading order for NNN 3-body forces via Delta(1232)-excitation fails. As an isosinglet particle the Lambda will couple to isoscalar mesons, hence 2-pion "sigma" exchange will be the leading order contribution – apart from minor, probably negligible, contribution by the eta-meson. In either case, for the Lambda the N*-mechanism is restricted to the N*(1440) Roper-resonance and other I=1/2 resonances at even higher masses. However, for the Sigma and Cascade hyperons the situation resembles much more the one encountered for nucleons. Since these are I=1 and I=1/2 states they are coupled easily to the kind of diagrams known from NNN-interactions.

Thus poses an interesting question: if for the Lambda-A interaction considerable in-medium modifications are observed they are more likely to originate from polarization effects. If so, the Lambda might be considered as a perfect probe to study induced interactions.

The energy-momentum ranges covered by the experiments will certainly not allow to access the quark core of baryons. So, arguments based on pure QCD-properties should be used with great care.

By lack of time (and expertise ;)!) I did not read the sections on the design of the experiments. Anyway, the physics cases behind the proposals are so strong and convincing that I' m pretty sure of their success. They will give a strong boost to strangeness physics, establishing J-Parc as a prime facility in that field.

Wishing you an exciting workshop, best
Horst

Weise, Wolfram weise@tum.de　4 月 17 日(土) 21:23

Dear Hiro and colleagues,

your proposed themes for the projected HIHR/K1.1 beam lines sound and look indeed promising!

I will most probably be available during at least parts of the week starting June 14, with the exception of June 16. Please keep me informed about the LOI and the further steps you are preparing.

Best regards,

Wolfram

差出人: **Jorge Segovia** jsegovia@upo.es
件名: Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC
日付: 2021年8月21日 15:55
宛先: miwa9@lambda.phys.tohoku.ac.jp、 miwa@nh.scphys.kyoto-u.ac.jp
CC: Feliciano de Soto fcsotbor@upo.es、 Pepe Rodriguez-Quintero jose.rodriguez@dfaie.uhu.es、
Jose Manuel Morgado Chávez jmorgado1@us.es

Dear Prof. Kouji Miwa, Chair of J-PARC Hadron Hall Users' Association,
We have known that the activities at the J-PARC Hadron Experimental Facility, being one of the very few places having at its hand secondary meson beams, are well acknowledged in particle, hadron, and nuclear physics, and their related fields. In particular, we believe that their projects conducted at J-PARC are internationally important and need further support from the world-wide community. It would be our great pleasure to strongly support the Hadron Experimental Facility Extension Project at J-PARC; in particular, the hadron studies related with conventional mesons and baryons but also exotic matter such as multiquark systems.

I hope for further success in the new project, whose documentation has been meticulously prepared by the working group of the Hadron Experimental Facility Extension Project at J-PARC, and with the feedback of the international community through a series of workshops.

Sincerely

August 21st, 2021,

University Pablo de Olavide, in Seville, Spain, Prof. Dr. Jorge Segovia (jsegovia@upo.es)
University Pablo de Olavide, in Seville, Spain, Prof. Dr. Feliciano de Soto
University of Huelva, Spain, Prof. Dr. José Rodriguez-Quintero
University of Huelva, Spain, Dr. José Manuel Morgado-Chávez

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1933

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http://www.unifesp.br

Title: Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC

Dear Prof. Koji Miwa, Chair of J-PARC Hadron Hall Users' Association,

The projects carried out at the J-PARC Hadron Experimental Facility are well-known to the community of strong interaction physics. I, my colleagues and the students in our group, for example, regularly follow the papers and letters of intent from J-PARC. The studies held at the J-PARC facility bring valuable information to the community, which is internationally discussed and deserves worldwide support. It is a pleasure for me to write this letter and strongly support the Hadron Experimental Facility Extension Project at J-PARC. I wish a further success in the new project.

Sincerely,
Kanchan Khemchandani.

August 19 2021,
Professor Kanchan Khemchandani,
Federal University of São Paulo,
Brazil.

JUSTUS-LIEBIG-
UNIVERSITÄT
GIESSEN

FACHBEREICH 07
Mathematik
und Informatik,
Physik, Geographie

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Institut für Theoretische Physik

Prof. Dr. Dr. habil. Horst Lenske
Heinrich-Buff-Ring 16
D-35392 Gießen
Tel.: 0641 / 99 – 33311/33361
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Email: horst.lenske@physik.uni-giessen.de

Az. :

24. August 2021

Prof. Koji Miwa (Tohoku University),
Chair of J-PARC Hadron Hall Users' Association
(HUA)

Betreff: Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC

Dear Koji,

With excitement and interest I took notice of the extension project at J-PARC. Strangeness physics has become of high actuality. Hypernuclear physics is an essential part of the research programs at international facilities from JLAB in the US to MAMI@Mainz and practically all experiments being under construction at the upcoming new FAIR@GSI laboratory. In the era of multi-messenger astronomy and in view of the unexpected observations of the production of light hypernuclei in heavy ion experiments at RHIC@Brookhaven and LHC@CERN strangeness physics has become in recent years a key issue for understanding the equation of state of highly compressed matter and the evolution of compact stellar objects on their path to formation of black holes.

As a convener and a member of the board of representatives of the NUSTAR experiment, a member of the theory advisory group of PANDA, and co-initiator of the European project THEIA-STRONG2020 I am being deeply involved in this flourishing and rapidly expanding research field. I am writing this letter of support for the extension of the J-PARC facility out of strong enthusiasm for the exciting physics program which will strengthen further the traditional strong position of Japanese hypernuclear and strangeness physics research, establishing J-PARC at a top position for at least the next decade.

The challenging and demanding projects have the potential to dominate these research areas in many important aspects. As one of the key examples, I emphasize in particular the planned experiments on hyperon-nucleon scattering data, including spin-observables. Presently, the whole field relies on about 40 (!) data points of poor statistical quality from the 1960ies. The proposed - worldwide unique – collection of experiments will enlarge and solidify the data base tremendously, becoming a corner stone of strangeness and hypernuclear physics. Together with the also envisioned investigations of single- and multi-strangeness hypernuclei for the first time a consistent set of validated data will be available. These data will allow e.g. to explore and solve the long-standing and controversially debated “hyperon puzzle” of neutron star physics, relying strongly on our understanding of hyperon interactions in a dense nuclear medium. Moreover, the data will be of extremely high relevance for the exploration of SU(3)-flavour physics in the octet sector and beyond.

JUSTUS-LIEBIG-
UNIVERSITÄT
GIESSEN

FACHBEREICH 07
Mathematik
und Informatik,
Physik, Geographie

I strongly support the J-PARC extension project and recommend with explicit emphasis the realization of the project in full. I am convinced that the international nuclear physics community will highly appreciate the achievements once this outstanding project is delivering results.

With best regards,

Prof. Dr. Horst Lenske

差出人: **Prof. Dr. Horst Lenske** horst.lenske@physik.uni-giessen.de
件名: Re: Could you please write a supporting letter for J-PARC (HIHR/K1.1) project ?
日付: 2021年8月19日 17:58
宛先: Hirokazu TAMURA tamura@lambda.phys.tohoku.ac.jp
CC: Koji Miwa miwa9@lambda.phys.tohoku.ac.jp、 Satoshi N. Nakamura nue@lambda.phys.tohoku.ac.jp

Dear Koji, Nue, and Hiro,
It will be a great pleasure to support your projects. Best
Horst

Vom iPhone gesendet

> Am 18.08.2021 um 18:49 schrieb Hirokazu TAMURA <tamura@lambda.phys.tohoku.ac.jp>:
>
> Dear participants in the J-PARC HIHR/K1.1 Workshop,
>
> Thank you for your interest and support for the strangeness
> nuclear physics program at J-PARC HIHR/K1.1 beam lines
> planned to be built in the J-PARC Hadron Facility Extension
> Project.
>
> We have recently prepared the 3rd White Paper for the J-PARC Hadron
> Facility Extension Project (see below).
> Then, a focused review committee of the project was formed
>
> under the J-PARC PAC, in which we made presentations last week:
> https://kds.kek.jp/event/38930/
>
> The committee wants to know how many experimentalists and theorists
>
> are supporting the project.
>
> To receive better evaluation, we need to collect many supporting letters
>
> for the project from collaborators and supporters, in particular from abroad.
>
> We appreciate it very much if you and your colleagues could support the project
>
> (the Hadron Facility Extension Project, and/or the HIHR/K1.1 program),
>
> express it as supporting letters, and send the letters via e-mail.
>
> We do not mind the letter format. But, for your convenience, we attach a template
>
> of the letter below. Feel free to modify it as you wish.
>
> Please sent it to:
>
> Prof. Koji Miwa (Tohoku University), Chair of J-PARC Hadron Hall Users' Association,
> miwa9@lambda.phys.tohoku.ac.jp
>
> with CC to: tamura@lambda.phys.tohoku.ac.jp and nue@lambda.phys.tohoku.ac.jp
>
> at your earliest convenience (but by the end of next week when the committee will write conclusions).
>
> Thank you again for your support.
>
> Best regards,
>
> Koji Miwa, Nue Nakamura, and Hiro Tamura
>
> ---
> ＊The 3rd White Paper for the J-PARC Hadron Facility Extension Project:
> Chapt.1
> https://drive.google.com/file/d/1WB_UZzP3uVUvnIh2KfQFd90iTuxYeECA/view?usp=sharing
> Chapt.2
> https://drive.google.com/file/d/1-bKAhhRvQ_zefmANuNUCkbpzj68iAYw4/view?usp=sharing
> Chapt.3
> https://drive.google.com/file/d/15USg4U2oRx4QbuA09fTJsT9nn-KoHhF7/view?usp=sharing
>
> ＊Proposals of experiments submitted to J-PARC PAC
> P84(HIHR):

https://drive.google.com/file/d/12LEES20n3SP4gMsYC21D6anMD18dgD4e/view?usp=sharing
P85(K10):
https://drive.google.com/file/d/1khvR0F2TSb7uUBKmfUyJNJa1qHqyynVp/view?usp=sharing
P86(K1.1):
https://drive.google.com/file/d/1oUbuWaFNTl39pCJy-1Z50MPLjAgCZHEE/view?usp=sharing

==========
Hirokazu Tamura 田村 裕和
Dept.of Physics, Tohoku University, 東北大学理学研究科物理 (原子核物理)
Aramaki, Aoba-ku, Sendai 980-8578, Japan 980-8578 仙台市青葉区荒巻字青葉
TEL: +81-22-795-6454 FAX: +81-22-795-6455
==========
<Support_letter_template.docx>

差出人： **耿立升** lisheng.geng@buaa.edu.cn
件名： Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC
日付： 2021年8月19日 19:16
宛先： miwa9@lambda.phys.tohoku.ac.jp
CC： tamura@lambda.phys.tohoku.ac.jp、 nue@lambda.phys.tohoku.ac.jp

Dear Prof. Koji Miwa, Chair of J-PARC Hadron Hall Users' Association,

As my recent research interets include hyperon-nucleon and hyperon-hyperon interaction, I have realized more that the activities at the J-PARC Hadron Experimental Facility are well acknowledged in particle, hadron, and nuclear physics, and their related fields. In particular, I believe that your projects conducted at J-PARC are internationally important and need further support from the world-wide community. It would be my great pleasure to strongly support the Hadron Experimental Facility Extension Project at J-PARC. I hope a further success in the new project, via which we will understand better the world we live and the role strangeness plays.

Sincerely

Lisheng Geng, Professor of Physics

Beihang University

August 19, 2021

Department of Physics
Hunan Normal University
Changsha, 410081, China

Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC

Dear Prof. Koji Miwa,
Chair of J-PARC Hadron Hall Users' Association,

I have known that the activities at the J-PARC Hadron Experimental Facility are well acknowledged in particle, hadron, and nuclear physics, and their related fields. In particular, I believe that their projects conducted at J-PARC are internationally important and need further support from the world-wide community. It would be my great pleasure to strongly support the Hadron Experimental Facility Extension Project at J-PARC. I hope a further success in the new project.

Sincerely yours,

Qi-Fang Lü

Associate professor Qi-Fang Lü
Department of Physics, Hunan Normal University
Lushan Road 36, Yuelu District, Changsha, 410081, China
Email: lvqifang@hunnu.edu.cn
Aug. 20th, 2021

Rez/Prague, August 27, 2021

Prof. Koji Miwa (Tohoku University)
Chair
J-PARC Hadron Hall Users' Association (HUA)

Letter of support for
the Hadron Experimental Facility Extension Project at J-PARC

Dear Prof. Miwa,

The J-PARC Hadron Experimental Facility belongs to the world-leading physics laboratories. It has been playing an important role in particle, hadron, and nuclear physics, as well as in related fields. The hadron and (hyper)nuclear physics experiments conducted there have been contributing significantly to our better understanding of hadrons, hadronic systems and their interactions. Therefore, they have been always strongly supported by the world-wide community of experimentalists and theorists.

It is our great pleasure, as well as in our own interest, to support the Hadron Experimental Facility Extension Project at J-PARC, and the activities of HUA directed towards proposing the project. We find the project highly compelling and we strongly desire its early realization including eagerly awaited newly-proposed experiments.

Our group of hypernuclear and hadron physics has been established by late J. Zofka, L. Majling, and M. Sotona in the eighties. Since then, it has been contributing to the development of the field by studying strangeness production, structure and decay of hypernuclei, as well as other systems involving strange hadrons, in close international collaboration, where physicists from Japan - theorists as well as experimentalists - have played an important role.

At present, we explore the structure of light Λ hypernuclei including underlying ΛN and ΛNN interactions; the nature of Λnn and $^{3}_{\Lambda}H^{*}(3/2^{+})$;

charge symmetry breaking in hypernuclei; lightest double-Λ hypernuclei; decay of hypertriton; production and structure of heavier hypernuclei. Members of our group are also active in studying meson-nucleon and meson-nuclear interactions. For our calculations new, more precise data are badly needed, such as data from the γ-ray spectroscopy measurements of the hypertriton planned at the J-PARC K1.1 beamline, direct information on the spin dependence of the ΛN interaction from the planned scattering experiments with polarized Λ hyperons or higher accuracy of measured spectra of heavier Λ hypernuclei. For our group, the planned experiments on determining the ΣN scattering length and the formation of (not yet observed) η and η′ nuclear bound states are of the highest interest as well.

It is thus clear that we wish the Hadron Experimental Facility Extension Project at J-PARC success and look forward indeed to new, high-quality data provided by the experiments under consideration.

Sincerely,

Jiri Mares
Department of Theoretical Physics
Nuclear Physics Institute CAS
25068 Rez, Czech Republic

on behalf of my colleagues from our group:
P. Bydzovsky
P. Bruns
A. Cieply
D. Gazda
J. Hrtankova
D. Petrellis
M. Schaefer
N. Shevchenko
D. Skoupil
P. Vesely

UNIVERSITAS INDONESIA
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ILMU PENGETAHUAN ALAM

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www.physics.ui.ac.id

Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC

Dear Prof. Koji Miwa,

Chair of J-PARC Hadron Hall Users' Association.

In recent years I have learned that the activities at the J-PARC Hadron Experimental Facility are well recognized in particle, hadron, and nuclear physics, and their related fields. This can be seen in the corresponding research results reported in the leading physics journals during the last years. Especially, I believe that the experimental projects conducted at J-PARC are internationally important and require further support from the international community. Therefore, it is a great pleasure for me to strongly support the Hadron Experimental Facility Extension Project at J-PARC. With the extension of these projects, I am sure to see further successes made by experimentalists and theorists working at the Hadron Experimental Facility at J-PARC in the future.

Sincerely yours.

Depok, August 20, 2021

Prof. Dr. rer. nat. Terry Mart
Professor of Physics,
Departemen Fisika, FMIPA,
Universitas Indonesia,
Depok 16424, Indonesia

Email: terry.mart@sci.ui.ac.id
Homepage: https://physics.ui.ac.id/terry-mart/

差出人： **Lutz, Matthias** m.lutz@gsi.de
件名： Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC
日付： 2021年8月21日 16:15
宛先： takizawa@ac.shoyaku.ac.jp

Dear Prof. Koji Miwa, Chair of J-PARC Hadron Hall Users' Association,

the activities at the J-PARC Hadron Experimental Facility are well acknowledged in particle, hadron, and nuclear physics, and their related fields. In particular, I believe that the projects conducted at J-PARC are internationally important and deserve further support from the world-wide community. It is my great pleasure to strongly support the Hadron Experimental Facility Extension Project at J-PARC.

Sincerely,

Matthias F.M. Lutz

Prof. Dr. Matthias F.M. Lutz

GSI Helmholtzzentrum für Schwerionenforschung GmbH
Planckstraße 1
64291 Darmstadt
Telefon: 06159-71-2758

Institut fuer Kernphysik
Technische Universitaet Darmstadt
Schlossgartenstr. 2
D-64289 Darmstadt

Department of Physics
College of Natural Sciences
Kyungpook National University
Daehak-ro 80, Buk-gu, Daegu 41566, KOREA

20, August, 2021

Yongseok Oh, Ph.D
Professor
Department of Physics
Kyungpook National University
Daegu 41566, Korea
Email: yohphy@knu.ac.kr

Prof. Koji Miwa
Chair of J-PARC Hadron Hall Users' Association

Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC

Dear Prof. Koji Miwa,

I have known that the activities at the J-PARC Hadron Experimental Facility are well acknowledged worldwide in particle, hadron, and nuclear physics, and their related fields. In particular, we believe that their projects conducted at J-PARC are very timely and internationally important, and need further support from the world-wide community as well as from the Japanese government. It would be my great pleasure to strongly support the Hadron Experimental Facility Extension Project at J-PARC and I am willing to contribute to the success of this project. I hope a further success in the new project.

Sincerely yours,

Yongseok Oh

Department of Physics
Kyungpook National University
Daegu 41566, Republic of Korea

GOBIERNO
DE ESPAÑA

MINISTERIO
DE ECONOMIA Y
COMPETITIVIDAD

CSIC
IFIC - INSTITUTO DE FISICA
CORPUSCULAR

Eulogio Oset
Miembro del IFIC
Catedrático de Física Teórica
Universidad de Valencia

Teléfono: +34 96 3543525
Fax: +34 96 3543488
E-mail: oset@ific.uv.es

Letter in support of J-PARC

21 de Agosto de 2021

Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC

Dear Prof. Koji Miwa, Chair of J-PARC Hadron Hall Users' Association:

The activities at the J-PARC Hadron Experimental Facility are well acknowledged in particle, hadron, and nuclear physics, and their related fields. The findings at the Lab have brought new insight into the structure of new states highly debated in the hadron and nuclear physics communities. In particular, we believe that the projects conducted at J-PARC are internationally important and need further support from the world-wide community. It is my great pleasure to strongly support the Hadron Experimental Facility Extension Project at J-PARC and express my hopes for further success of the new project.

Sincerely

Eulogio Oset
Miembro del IFIC
Catedrático de Física Teórica
Universidad de Valencia

中国科学院高能物理研究所
Institute of High Energy Physics
Chinese Academy of Sciences

From: Professor Qiang Zhao (Deputy Director)
Theoretical Physics Division
Institute of High Energy Physics
Chinese Academy of Sciences
Beijing 100049
P.R. China
Tel: 0086-10-88236578
Email: zhaoq@ihep.ac.cn

August 20, 2021

To: Professor Koji Miwa
Chair of J-PARC Hadron Hall Users' Association

Title: Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC

Dear Prof. Koji Miwa,

I am writing this supporting letter intending to express my strongest support of the Hadron Experimental Facility Extension Project at J-PARC.

The activities at the J-PARC Hadron Experimental Facility have covered a broad range of exciting topics in particle, hadron, and nuclear physics, and their related fields. So far, our community has benefitted many important measurements and crucial results from the Hadron Experimental Facility at J-PARC which are advancing our understanding of fundamental aspects within the strong interacting nuclear systems. We believe that these projects conducted at J-PARC are internationally important and need further support from the world-wide community. Thus, it would be my great pleasure to strongly support the Hadron Experimental Facility Extension Project at J-PARC and I'd wish a continuous success of this new project.

Yours sincerely,

Qiang Zhao

UNIVERSITAT DE BARCELONA

Departament de Física Quàntica i Astrofísica and ICC

Facultat de Física
C/ Martí i Franquès, 1
08028 - Barcelona

Tel. +34 934 039 192
angels.ramos@ub.edu
http://www.icc.ub.edu

Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC

To: Prof. Koji Miwa (Tohoku University), Chair of J-PARC Hadron Hall Users' Association (HUA)

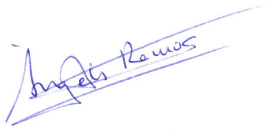
Dear Koji,

I have been following with extreme interest the experimental activities carried out at the J-PARC Hadron Experimental Facility for many years, as they have greatly contributed to the advance of particle, hadron, and nuclear physics, also having a tremendous influence in other fields such as astrophysics and cosmology. The experiments in hadron and nuclear physics conducted at J-PARC have been of upmost importance to understand basic science, have brought solutions to problems that had remained unresolved in the field for many years, and have raised interesting new questions that need to be understood. The international community regards with high respect and admiration the J-PARC achievements that have been made possible thanks to the characteristics of the Hadron Facility itself, but also thanks to the effort of a large and well-trained community of physicists with solid international connections. I would like to emphasize that the field of strangeness nuclear physics would not exist without the experimental efforts that have been conducted at J-PARC during the past years.

Having this precedent in mind, with this letter I would like to give a strong and convinced support to the Hadron Experimental Facility Extension Project at J-PARC, and the activities of the HUA for proposing the project. I believe that this Extension Project will establish J-PARC as the place hosting the best facility in the world to learn about the physics lying in the border of particle and nuclear physics. The capabilities of the proposed beam lines (high intensity, high resolution) will be unique in the world, and the dedicated experiments that can be conducted there will bring new light into still unresolved problems, as clearly explained in the proposal. Characterizing the spin-dependence of the hyperon-nucleon interaction, obtaining its dependence with the nuclear density, learning about the doubly strange baryon-baryon force… are just a few examples of the very relevant information that can be obtained at the proposed facility and, as a theorist, I am eager to contrast the hypothetical new data with theoretical models and lattice simulations, thereby contributing to the advance in the generation of knowledge in the fields of hadron and nuclear physics.

I believe the project and the newly proposed experiments are of upmost importance for the international community, given the fact that other hadron facilities are either reaching the end of their lifetime (DAPHNE@FRASCATI) or are not fully dedicated to hadron/nuclear physics problems (Jlab, LHCb,…). The research activities conducted in the Hadron and Nuclear Theory group at the University of Barcelona will greatly benefit from the outcomes of such a Facility and we are looking forward to establishing ties and collaborations with the groups conducting the experiments there.

Sincerely,



Angels Ramos
Professor of Physics
(on behalf of the Hadron and Nuclear Theory group of the University of Barcelona)
Barcelona, August 24, 2021

Lyon, September 6, 2021

Prof. Koji Miwa
Chair of J-PARC Hadron
Users' Association

Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC

Dear Prof. Koji Miwa

We have known that the activities at the J-PARC Hadron Experimental Facility are well acknowledged in particle, hadron, and nuclear physics, and their related fields. In particular, we believe that their projects conducted at J-PARC are internationally important and need further support from the world-wide community. It would be my great pleasure to strongly support the Hadron Experimental Facility Extension Project at J-PARC. I hope a further success in the new project, that will stimulate international collaborations around this physics.

Yours very sincerely,

Jean-Marc Richard
Professeur à l'Université Lyon 1,
Institut de Physique des 2 Infinis de Lyon,
4, rue Enrico Fermi,
69622 Villeurbanne cedex
e-mail : j-m.richard@ipnl.in2p3.fr
phone : +33 4 72 44 84 39

Theoretical High Energy Physics

Faculty of Science
Radboud University

Institute for Mathematics, Astrophysics, and Particle Physics

P.O. Box 9010
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E-mail t.rijken@science.ru.nl

www.theorphys.science.ru.nl

To: Prof. Koji Miwa (Tohoku University), Chair of J-PARC Hadron Hall Users' Association (HUA)

Our Ref. Your Ref. Direct n

Subject Persona

Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC and the HIHR/K1.1 program

Dear Koji,

The experimental activities at the J-PARC Hadron Experimental Facility have played a significant role in particle, hadron, and nuclear physics as well as their related fields. In particular, the hadron/nuclear physics experiments conducted there have been internationally important and supported by the world-wide community.

It is our great pleasureto support the Hadron Experimental Facility Extension Project at J-PARC, and the activitiesof HUA for proposing the project. We believe the project including the newly-proposed experiments are quite compelling and we strongly desire early realization of the project.

Accurate measurements of ΛP and ΣP differential cross sections will lead to a determination of the P-waves in particular. This will be very important for establishing the hyperon-nucleon two-body interactions. The $\Lambda-, \Sigma-$ nucleon interaction plays a key role in establishing the baryon-baryon interactions because via SU3-symmetry it has impact on the nucleon-nucleon, cascade-nucleon, etc. interactions.

Sincerely yours, Prof. Dr. Th.A. Rijken

THE UNIVERSITY OF CHICAGO

THE ENRICO FERMI INSTITUTE

5640 SOUTH ELLIS AVENUE

CHICAGO · ILLINOIS 60637-1433

August 26, 2021

Prof. Koji Miwa, Chair
J-PARC Hadron Hall Users' Association

Dear Professor Miwa :

I am writing in support of the planned extension of the Hadron Experimental Facility at J-PARC. I have admired Japan's particle physics program for many years, having served on the Lepton Collider Program Advisory Committee during 1999-2004 and the Roadmap Advisory Committee in 2008. It is a great pleasure to see the variety of physics that J-PARC will be able to address with the envisioned extension.

The proposed program has three major thrusts, each focused on critical problems in particle physics. (1) Strange quarks can soften a neutron star's equation of state, reducing the upper limit on its mass. However, neutron star mergers detected by LIGO indicate that some neutron stars can exceed that limit. This is the "hyperon puzzle," to be addressed by intensive studies of nuclei contaiting one or more strange quark. (2) Recent dtudies of strange and charmed baryons have broadened the applicability of the quark model, allowing descriptions similar to the semi-empirical formula for nuclear isotope masses. These approaches are ripe for experimental study. (3) Rare kaon decays can probe the standard model (SM) with unprecedented accuracy, limited only by the available proton flux. My colleague Yau Wah has spoken highly of his experience in searching for the decay $K_L \to \pi^0 \nu\bar{\nu}$ at J-PARC, and looks forward to reaching SM sensitivity with the upgrade's help.

J-PARC can foresee a bright future with the proposed extension, taking its rightful place as a world leader on the Intensity Frontier of particle physics.

Sincerely,

Jonathan L. Rosner

Jonathan L. Rosner
Professor of Physics

Istituto Nazionale di Fisica Nucleare

August 23, 2021, Genoa, Italy

Title: Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC

Dear Prof. Koji Miwa, Chair of J-PARC Hadron Hall Users' Association,

We have known that the activities at the J-PARC Hadron Experimental Facility are well acknowledged in particle, hadron, and nuclear physics, and their related fields. In particular, we believe that their projects conducted at J-PARC are internationally important and need further support from the world-wide community. It would be my great pleasure to strongly support the Hadron Experimental Facility Extension Project at J-PARC. I hope a further success in the new project.

Sincerely

Prof. Elena Santopinto
INFN, Sezione di Genova,
via Dodecaneso 33
I-16146 Genova, Italy

Title: Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC

Dear Prof. Koji Miwa, Chair of J-PARC Hadron Hall Users' Association,

the activities at the J-PARC Hadron Experimental Facility in particle, hadron, and nuclear physics, and their related fields are internationally highly regarded in their respective communities. Therefore, it is of utmost importance that the projects conducted at J-PARC receive further support from the world-wide community. It is my great pleasure to strongly support the Hadron Experimental Facility Extension Project at J-PARC. I wish you continued success with the new project.

Sincerely yours,

Prof. Dr. Stefan Scherer
Institute for Nuclear Physics, Johannes Gutenberg University
Mainz, Germany
24 August 2021

差出人: Seung-il Nam <gariwulf@gmail.com>

件名: Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC

日付: 2021年8月19日 22:15:27 JST

宛先: Atsushi Hosaka <hosaka@rcnp.osaka-u.ac.jp>

Dear Prof. Koji Miwa, Chair of J-PARC Hadron Hall Users' Association,

We have known that the activities at the J-PARC Hadron Experimental Facility are well acknowledged in particle, hadron, and nuclear physics, and their related fields. In particular, we believe that their projects conducted at J-PARC are internationally important and need further support from the world-wide community. It would be my great pleasure to strongly support the Hadron Experimental Facility Extension Project at J-PARC. I hope for further success in the new project.

19th August 2021
Pukyong National University (Korea),
Seung-il Nam (Associate professor)
Sang-Ho Kim (Research professor)
Hatauruk Parada (Research professor)

Department of Physics, Yonsei University

Professor Su Houng Lee
Department of Physics
Yonsei University
Yonsei-ro 50, Seodaemun-Gu
Seoul 03722, Korea

August 20 2021
Prof. Koji Miwa
Chair of J-PARC Hadron Hall Users' Association

Dear Prof. Miwa

We have known that the activities at the J-PARC Hadron Experimental Facility are well acknowledged in particle, hadron, and nuclear physics, and their related fields. In particular, we believe that their projects conducted at J-PARC are internationally important and need further support from the world-wide community. J-PARC Hadron experiments and the physics probed by the users are unique, pioneering and of utmost importance for the understanding of current puzzles in nuclear and particle physics. Their activities and extension project will solidify their role as the world leading focal point in these endevour. It would be my great pleasure to strongly support the Hadron Experimental Facility Extension Project at J-PARC. I hope a further success in the new project.

Sincerely

Su Houng Lee
email:suhoung@yonsei.ac.kr

Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC
To: Prof. Koji Miwa (Tohoku University), Chair of J-PARC Hadron Hall Users' Association (HUA)

Dear Koji,

The experimental activities at the J-PARC Hadron Experimental Facility have played significant roles in particle, hadron, and nuclear physics as well as their related fields. In particular, the hadron/nuclear physics experiments conducted there have been internationally important and supported by the world-wide community.

It is my great pleasure to support the Hadron Experimental Facility Extension Project at J-PARC, and the activities of HUA for proposing the project. We believe the project including the newly-proposed experiments are quite compelling and we strongly desire early realization of the project.

I am particularly interested in the proposed studies of the strange systems. These include proposals of new experiments with K mesic atoms, Lambda- proton scattering and search of nuclear states of K mesons. Myself, I have been working in this field and related fields for a long time. Recently, I have been attached to AMADEUS project at INCN / Frascati Laboratory. The latter Laboratory is a kind of J-PARC collaborator as a number of experimental colleagues participate and plan to participate in the proposed experiments. It is also a competitor and that reflects a healthy situation of the field.

In addition, I wish to add some personal remarks. I joined experiment PUMA at CERN, which aims to create antiprotonic atoms with unstable nuclei. It originated in Japan (RIKEN) and is currently materializing in Europe. In both fields, I have worked with Japanese scientists and I have been impressed by their knowledge and their passion. I wish this is offered a chance to continue.

Another aspect of my joy is hyper-nuclear physics, which originated in my country with the first findings of a single and double hyper-nucleus. It now thrives in Japan and is a source of pride for Japanese physicists.

Sincerely,

Slawomir Wycech,
Professor, National Institute for Nuclear Research , Theory Division, Warsaw, Poland

19 August 2021

Dear Koji,

The experimental activities at the J-PARC Hadron Experimental Facility have played significant roles in particle, hadron, and nuclear physics as well as their related fields. In particular, the hadron/nuclear physics experiments conducted there have been internationally important and supported by the world-wide community.

It is our great pleasure to support the Hadron Experimental Facility Extension Project at J-PARC, and the activities of HUA for proposing the project. We believe the project including the newly-proposed experiments are quite compelling and we strongly desire early realization of the project.

We have been working on the theoretical study of hypernuclear low-lying states, from which, we are aimed to determine hyperon-nucleon (YN) interaction. The YN interaction is currently poor constrained. More data are required to improve our understanding on the YN interaction which plays an important role in the neutron stars.

Sincerely,

August 19, 2021
Prof. Jiangming Yao
School of Physics,
Sun Yat-sen University,

THE UNIVERSITY OF
TENNESSEE
KNOXVILLE

Title: Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC
To: Prof. Koji Miwa (Tohoku University), Chair of J-PARC Hadron Hall Users' Association (HUA)

Dear Koji,

The experimental activities at the J-PARC Hadron Experimental Facility have played significant roles in particle, hadron, and nuclear physics as well as their related fields. In particular, the hadron/nuclear physics experiments conducted there have been internationally important and supported by the world-wide community.

It is my great pleasure to support the Hadron Experimental Facility Extension Project at J-PARC, and the activities of HUA for proposing the project. The project includes newly-proposed, extremely compelling, novel and forward-looking experiments, uniquely suited for the proposed facility.

I support most strongly the earliest possible realization of the project.

Sincerely,

J. R. Stone .

Jirina Rikovska Stone

August 19, 2021

Professor of Physics (Adjunct)
Department of Physics and Astronomy, University of Tennessee, Knoxville, TN, USA
Academic Visitor
Department of Physics (Astrophysics) University of Oxford, Oxford, UK
Visiting Scientist
Strangeness Nuclear Physics Laboratory
RIKEN, Nishina Center for Accelerator-Based Physics, Japan

Anthony W Thomas AC FAA, FAIP, CSci, F Inst P

Elder Professor of Physics
Director: Adelaide Node of CoEPP and CSSM
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University of Adelaide
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Prof. Koji Miwa (Tohoku University),
Chair J-PARC Hadron Hall Users' Association

20th August 2021

Re: Hadron Experimental Facility Extension Project at J-PARC

Dear Professor Miwa,

As a member of the J-PARC PAC I have been privileged to see the plans for a number of new experiments that would be made possible by building this extension. I am particularly interested in the new capabilities to explore the properties of nuclei containing strange baryons, such as the cascade and the capacity to define hyperon-nucleon forces.

I would like to express my strong support for this exciting new initiative at J-PARC. This laboratory has already shown that the high quality of the facilities and the professionalism of the staff can attract many overseas researchers, leading to important new insights into nuclear and particle physics. The Hadron Hall Extension will dramatically enhance those capabilities.

Yours Sincerely

Anthony W Thomas

差出人: atitov@theor.jinr.ru

件名: Supporting Letter for the Hadron Experimental Facility　Extension Project at J-PARC

日付: 2021年8月21日 22:18:06 JST

宛先: "Atsushi Hosaka" <hosaka@rcnp.osaka-u.ac.jp>

Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC

Dear Prof. Koji Miwa, Chair of J-PARC Hadron Hall Users' Association,

We have known that the activities at the J-PARC Hadron Experimental Facility are well acknowledged in particle, hadron, and nuclear physics, and their related fields. In particular, we believe that their projects conducted at J-PARC are internationally important and need further support from the world-wide community. It would be my great pleasure to strongly support the Hadron Experimental Facility Extension Project at J-PARC. I hope a further success in the new project.

Sincerely,

09/17/2021

Chief Researcher
Professor, Doctor of Physics and Mathematics
Bogoliubov Laboratory of Theoretical Physics,
Joint Institute for Nuclear Research
(International Intergovernmental Organization),
Dubna, Russia

CSIC
Consejo Superior de Investigaciones Científicas

Institute of Space Sciences

Campus UAB, c. Can Magrans s/n,
08193 Bellaterra, Barcelona
Phone: +34 937 379 788
ice@ice.csic.es - http://www.ice.csic.es

Title: Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC

To: Prof. Koji Miwa (Tohoku University), Chair of J-PARC Hadron Hall Users' Association (HUA)

Dear Koji,

The experimental activities at the J-PARC Hadron Experimental Facility have played significant roles in particle, hadron, and nuclear physics as well as their related fields. In particular, the hadron/nuclear physics experiments conducted there have been internationally important and supported by the world-wide community.

It is my great pleasure to support the Hadron Experimental Facility Extension Project at J-PARC, and the activities of HUA for proposing the project. I believe the project including the newly-proposed experiments are quite compelling and I strongly desire early realization of the project.

Sincerely,

Barcelona, 30 August 2021
Dr. Laura Tolos
Institute of Space Sciences (CSIC-IEEC) and University of Stavanger

Title: Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC

Dear Prof. Koji Miwa, Chair of J-PARC Hadron Hall Users' Association:

We are indeed aware that the activities at the J-PARC Hadron Experimental Facility are very important, have contributed, and will continuously contribute well for particle, hadron, and nuclear physics, as well as the related fields.

In particular, we believe that the projects conducted at J-PARC are internationally important, and need further support from the world-wide communities.

It would be our great pleasure to strongly support the Hadron Experimental Facility Extension Project at J-PARC.

We do hope a further success in the new project.

Sincerey, Kazuo, João Pacheco, Bruno, and Gilberto.

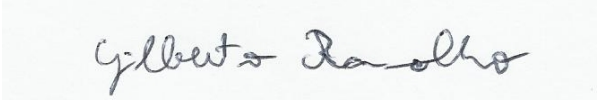
São Paulo, Brazil, August 22, 2021,

Laboratório de Física Teórica e Computacional – LFTC
Universidade Cidade de São Paulo (UNICID), and
Universidade Cruzeiro do Sul

Prof. Dr. Kazuo Tsushima

Prof. Dr. João Pacheco B. C. de Melo

Prof. Dr. Bruno El-Bennich



Prof. Dr. Gilberto T. F. Ramalho

Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC

To: Prof. Koji Miwa (Tohoku University), Chair of J-PARC Hadron Hall Users' Association (HUA)

Dear Prof. Koji Miwa,

The experimental activities at the J-PARC Hadron Experimental Facility have played significant roles in particle, hadron, and nuclear physics as well as their related fields. In particular, the hadron/nuclear physics experiments conducted there have been internationally important and supported by the world-wide community.

It is our great pleasure to support the Hadron Experimental Facility Extension Project at J-PARC, and the activities of HUA for proposing the project. We believe the project including the newly-proposed experiments are quite compelling and we strongly desire early realization of the project.

Hadron/nuclear physics experiments play a crucial role in the understanding of the structure of compact stars. During the last years it has become more and more clear that the possible production of hyperons at the center of compact stars have a deep impact on the structure of those stellar objects. It has been argued hyperonic three-body forces can potentially solve the so-called hyperon puzzle, namely the difficulty in reaching large neutron star masses if hyperons are present in their interior. By tunning those interactions it is possible to reach and exceed $2M_{sun}$ while allowing the formation of hyperons in the star. On the other hand, in order to claim that hyperons can really be formed in the core of a compact star it is fundamental to have the support of experimental data. From this point of view the Hadron Experimental Facility Extension Project at J-PARC, and the activities of HUA is crucial since it can provide the basic information to develop realistic models for nuclear dynamics at the core of compact objects.

For all these reasons I strongly support the Hadron Experimental Facility Extension Project at J-PARC, and the activities of HUA for proposing the project. It is importany both for the hadron/nuclear physics community and for the nuclear physics/astrophysics groups.

Sincerely,

Dr. Isaac Vidaña
Istituto Nazionale di Fisica Nucleare, Sezione di Catania, Italy

Catania, August 23rd 2021

差出人: **Weise, Wolfram** weise@tum.de
件名: J-PARC Hadron Experimental Facility Extension
日付: 2021年8月25日 2:23
宛先: miwa9@lambda.phys.tohoku.ac.jp
CC: tamura@lambda.phys.tohoku.ac.jp、 nue@lambda.phys.tohoku.ac.jp、 Weise, Wolfram weise@tum.de

Dear colleagues,

this message is written expressing my strongest support for the Hadron Experimental Facility extension project at J-PARC. As a former member of the J-PARC Program Advisory Committee (2012-2018), I had the privilege of witnessing the outstanding developments that established the Hadron Facility as a leading hadron physics laboratory worldwide. The previous successful experiments at that facility helped identify and promote key questions and issues of fundamental physics for the future in three major areas: strangeness nuclear physics (from hypernuclei to the quest for strangeness in the core of neutron stars); hadron structure (special focus on baryons with strange and charm quarks); and rare kaon decays (exploring physics beyond the limits of the Standard Model).

I share the enthusiasm for these topics with many of my European colleagues, including those of a very active younger generation of experimentalists and theorists who are part of the STRONG-2020 consortium funded by a major EU grant. I am very much convinced that there will be strong and dedicated interest from the European side in the future physics program of the extended Hadron Experimental Facility, and I wish you and the Japanese hadron physics community all the best of success in the forthcoming process.

Sincerely,
Wolfram Weise

Prof. Dr. Wolfram Weise
TUM Emeritus of Excellence
Physics Department
Technical University of Munich
85748 Garching, Germany
weise@tum.de

MHESI 7451/39

Prof. Dr. Yupeng Yan, Director
Center of Excellence in High Energy Physics and Astrophysics,
Suranaree University of Technology, Nakhon Ratchasima 30000, Thailand

August 20, 2021

Prof. Koji Miwa
Chair of J-PARC Hadron Hall Users Association

Prof. Koji Miwa

Greetings from Yupeng Yan, Suranaree University of Technology (SUT), Thailand!

I and my colleagues in the Center of Excellence in High Energy Physics and Astrophysics, SUT would like to express our strong support on the Hadron Experimental Facility Extension Project at J-PARC. We do believe that the projects conducted at J-PARC are internationally important and need further support from the world-wide community.

The activities at the J-PARC Hadron Experimental Facility have been well acknowledged in particle, hadron, and nuclear physics, and their related fields. We have to admit that the J-PARC activities and data has greatly benifited the research of faculty and students in our Hadron Physics Group.

We hope a great success would be achievd in the new project.

Sincerely yours,

Yupeng Yan

Prof. Dr. Yupeng Yan
Director
Center of Excellence in
High Energy Physics and Astrophysics,
Suranaree University of Technology

差出人: "Shi-Lin Zhu" <zhusl@pku.edu.cn>

件名: Supporting Letter for the Hadron Experimental Facility Extension Project at J-PARC

日付: 2021年8月20日 9:22:23 JST

宛先: "Atsushi Hosaka" <hosaka@rcnp.osaka-u.ac.jp>

CC: "Shi-Lin Zhu" <zhusl@pku.edu.cn>

Chair of J-PARC Hadron Hall Users' Association

Dear Prof. Koji Miwa,
The activities at the J-PARC Hadron Experimental Facility are well acknowledged in particle, hadron, and nuclear physics, and their related fields. In particular, the projects conducted at J-PARC are internationally important and need further support from the world-wide community. It would be my great pleasure to strongly support the Hadron Experimental Facility Extension Project at J-PARC. I hope a further success in the new project.

Sincerely yours,

Shi-Lin Zhu
Director, Institute of Theoretical Physics, Peking University
Changjiang Scholar, Ministry of Education

2021-08-20

PS: Atsushi, I don't have Koji Miwa's email address. Please forward my letter to him. Thanks a lot.