

PROPOSAL FOR EXPERIMENT AT RCNP

22-July-2003

TITLE:

Gamow-Teller Transitions from ^{48}Ca to Intermediate States of Double Beta Decay and to the IAS of Fragmented $M1$ States

SPOKESPERSON(s):

Full Name Sven Rakers
 Institution Institut für Kernphysik, Universität Münster
 Position Researcher
 Address Wilhelm-Klemm-Str. 9, D-48149 Münster, Germany
 Phone number +49-251-833-4966
 FAX number +49-251-833-4962
 E-mail rakers@uni-muenster.de

Full Name Yoshitaka Fujita
 Institution Department of Physics, Osaka University
 Position Associate Professor
 Address Machikaneyama, Toyonaka, Osaka, 560-0043
 Phone number +81-6-6850-5506
 FAX number +81-6-6850-5516
 E-mail fujita@rcnp.osaka-u.ac.jp

EXPERIMENTAL GROUP:

Full Name	Institution	Title or Position
T. Adachi	Department of Physics, Osaka University	D2
C. Bäumer	IKP, Münster	PhD student
A.M. Van den Berg	KVI, Groningen	Senior Scientist
D. De Frenne	Institute of Nuclear Science, University of Gent	Professor
D. Frekers	IKP, Münster	Professor
H. Fujita	RCNP, Osaka University	Researcher
K. Fujita	RCNP, Osaka University	D1
E.W. Grewe	IKP, Münster	PhD student
P. Haefner	IKP, Münster	PhD student
K. Hatanaka	RCNP, Osaka University	Professor
E. Jacobs	Institute of Nuclear Science, University of Gent	Professor
K. Kawase	RCNP, Osaka University	D1
A. Korff	IKP, Münster	Diploma student
A. Negret	Institute of Nuclear Science, University of Gent	PhD student
K. Nakanishi	RCNP, Osaka University	D1
L. Popescu	Institute of Nuclear Science, University of Gent	PhD student
Y. Sakemi	RCNP, Osaka University	Associate Professor
Y. Shimbara	RCNP, Osaka University	D3
Y. Shimizu	RCNP, Osaka University	D2

Full Name	Institution	Title or Position
Y. Tameshige	RCNP, Osaka University	M2
A. Tamii	RCNP, Osaka University	Associate Professor
H.J. Wörtche	KVI, Groningen	Senior Scientist
M. Yosoi	Department of Physics, Kyoto University	Assistant Professor

RUNNING TIME: ^{48}Ca data taking runs 2.0 days
 Measurements for the background isotopes
 (like ^{40}Ca , ^{42}Ca , O, C) 0.5 days
 Usually after a run of ≈ 3 days, the cyclotron and the beam
 line should be retuned. For the retuning 0.5 days

BEAM LINE: Ring : WS course, high resolution mode

BEAM REQUIREMENTS:

Type of particle	^3He
Beam energy	420 MeV
Beam intensity	10 ~ 20 nA
Energy resolution	$\Delta E \leq 100$ keV, small emittance

BUDGET: Support to the PhD students and Postdocs from Münster for their stay of about half a month.

SCHEDULE: We request the beam time late fall or winter, 2003. We have a wish to run the experiment together with the Ni isotope measurements of the Gent group to spare the time for beam tuning and dispersion matching.

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SPOKESPERSONS: Sven Rakers and Yoshitaka Fujita

1 Summary of Experiment

- **Summary of proposal and experiment:**

The objective is to measure GT^- high-resolution strength distributions in the nucleus ^{48}Sc by means of the $(^3\text{He}, t)$ reaction. In the $(^3\text{He}, t)$ reaction at $E = 140$ MeV/nucleon, the proportionality has been established for the transitions with $B(\text{GT}) \geq 0.04$ from the comparison with the GT strengths from the isospin analogous β decays [1, 2].

References

- [1] Y. Fujita et al., Phys. Rev. C **59**, 90 (1999).
- [2] Y. Fujita et al., Phys. Rev. C **67**, 064312 (2003).