Current status of approved experiments at RCNP cyclotron facility.

December 25, 2003
(For publications, conference proceedings are not included.
They are listed in RCNP Annual Reports.)

E5 Measurements for the zero degree inelastic scattering by the Grand Raiden Spectrometer
Harutaka Sakaguchi 6.0 6.0
1. Published together with E35
Zero-degree proton inelastic scattering to the 1^+, T=0 and T=1 states in ^{12}C
Y. Sakemi et al., Phys. Rev. C **51** (1995) 3162-3168.

E6 Elastic scattering of polarized protons on ^{4}He at intermediate energies
Masanobu Nakamura 5.0 5.0
1. Elastic proton scattering from 4He at 297 MeV
M. Yoshimura et al., Phys. Rev. C **63** (2001) 034618
2. Master thesis, Masato Yoshimura, Kyoto University, March 1993
Elastic proton scatterin from ^{4}He at 300 MeV
3. Doctor thesis, Masato Yoshimura, Kyoto University, March 2001
Elastic proton scattering from ^{4}He at 297 MeV

E7 Measurements for the proton elastic scattering at intermediate energies
Harutaka Sakaguchi 24.0 24.0
1. Elastic Scattering of Polarized Protons from ^{58}Ni at E_p= 192, 295 and 400 MeV
H. Sakaguchi et al., Phys. Rev. C **57** (1998) 1749-1755.
2. Master thesis, Atsushi Yamakoshi, Kyoto University, March 1993
Measuremets for the proton elastic scattering off ^{58}Ni、 ^{120}Sn at E$_p$ = 300, 400 MeV
3. Master thesis, Hiroyuki Takeda, Kyoto University, March 1996
Measurements for the proton elastic scattering off ^{12}C,^{58}Ni,^{120}Sn bu use of the 250 MeV protons and the mediaum effects in the measured observables.

E8 Quadrupole Mixed Symmetry States in Nuclei
Mamoru Fujiwara 3.5 3.5
1. Isospin Character of Low–lying states in ^{56}Fe
R. De Leo et al., Phys. Rev. C **53** (1996) 2718-2731.
2. Low-lying states of ^{56}Fe
R. De Leo et al., Phys. Rev. C **57** (1998) 1606-1616.

E12 Development of detection system for continuum spectra(I)
Masaru Matoba 0.5 0.5

E13 Study of highly excited states of ^{208}Pb by (^{3}He, ^{3}He') scattering
Tamio Yamagata 5.0 5.0
1. Successful description of elastic Scattering of ^{3}He particles at 150 MeV/nucleon with the single folding potential model
T. Yamagata et al., Phys. Rev. C **50** (1994) 2606-2607
2. Elastic scattering of ^{3}He particles at 450 MeV
T. Yamagata et al., Nucl. Phys. **A589** (1995) 425-434

E15 Test of a π-range spectrometer with a large solid angle by Cu(p,π) reaction
Norihiko Koori 2.0 2.0

E17 Measurements of analyzing powers in (p,n) quasi elastic scattering
Hideyuki Sakai 3.0 3.0
1. Master thesis, Hideaki Otsu, University of Tokyo, March 1993

Developments of the RCNP neutron detection facility and measurements of analyzing powers in (p,n) quasielastic scattering

2. Doctor thesis, Hideaki Otsu, University of Tokyo, March 1997
   Study of reaction mechanisms for (p, p') and (p, n) quasi elastic scatterngs

E18 Preliminary tests to calibrate the neutron polarimeter
Hideyuki Sakai 4.0 4.0

1. Facility for the (p,n) polarization transfer measurement
   H. Sakai et al., Nucl. Instr. Meth. **A 369** (1996) 120 - 134
2. Master thesis, Tomotsugu Wakasa, University of Tokyo, March 1994
   Calibration of the neutron polarimeter and the polarization transfer $D_{NN}0^\circ$ measurement for $(\vec{p}, \vec{n})$ reaction

E19 Test experiment to produce spin-polarized radioactive nuclear beams and to inject them into superfluid helium
Noriaki Takahashi 2.0 2.0

1. Master thesis, Yutaka Mizoi, Osaka University, March 1994
   Production of spin-polarized ^{12}B in projectile fragmentation reactions
2. Master thesis, Hajime Kobayashi, Osaka University, March 1994
   Behavior of "snowballs" in superfluid helium studied by spin-polarized ^{12}B

E26 Test experiments for the spin rotation parameters of proton elastic scattering at intermediate energies
Masaru Yosoi 2.0 2.0

E28 (p,pα) Knockout Measurements on Light Nuclei Using 350 MeV Protons
Akira Okihana 2.0 2.0

1. Published together with E46
   Quasifree processes in the ^{6}Li breakup reactions by alpha particles
   A.Okihana et al., Nucl. Phys. **A 614** (1997) pp.71-85

E29 Production of low lying pionic atom states in heavy nuclei using (p,^{2}He)π^- reaction
Nobuyuki Matsuoka 8.0 8.0

1. Search for Deeply-bound Pionic States Using (p,^{2}He) Reactions at 390.6 MeV
   N. Matsuoka et al., Phys. Lett. **B 359** (1995) 39-42
2. Master thesis, Eijiro Kubo, Kyoto University of Education, March 1997
   Search for deeply-bound π^- states in heavy nuclei

E30 Calibration of the neutron polarimeter and polarization tranfser measument for Gamow-Teller transitions
Hideyuki Sakai 8.0 8.0

1. Spin-Flip Strength in the Continuum and Effective Tensor Interactions via Polarization Transfer $D_{NN}(0^\circ)$ for $(\vec{p}.\vec{n})$ Reactions at 295 MeV
   T. Wakasa et al., Phys. Rev. C **51** (1995) R2871-R2875
2. Master thesis, Tetsushi Fujita, University of Tokyo, March 1996
   Study of pin dipole giant resonances by ^{12}C$(p, n)^{12}$N reaction

E34 Study of the microscopic structure of the Gamow-Teller Resonance in ^{208}Pb
Mamoru Fujiwara 7.0 7.0

1. Direct proton decay from the Gamow-Teller resonance in ^{208}Bi
   H. Akimune et al., Phys. Rev. C **52** (1995) 604-615.
2. Microscopic Structure of the Gamow-Teller Resonance in ^{208}Bi
   H. Akimune et al., Phys. Lett. **B 233** (1994) 107-113.
3. Distribution of the Gamow-Teller strength in ^{90}Nb and ^{208}Bi

A. Krasznaborkay et al., Phys. Rev. C **64** (2001) 067302.

4. Doctor Thesis, Hidetoshi Akimune, Kyoto University, July 1995
   Direct proton decay from Gamow-Teller giant resonanse.

E35 Measurements for the spin rotation parameters of the unnatural parity states by use of the high resolution spectrograph.
Yasuhiro Sakemi 8.0 8.0

1. Zero-degree proton inelastic scattering to the 1^+, T=0 and T=1 states in ^{12}C
   Y. Sakemi et al., Phys. Rev. C **51** (1995) 3162-3168.
2. Doctor Thesis, Yasuhiro Sakemi, Kyoto University, March 1996
   Zero-degree proton inelastic scattering to the 1^+, T=0 and T=1 states in ^{12}C

E38 Elastic scattering of polarized protons on ^{4}He at intermediate energies
Masanobu Nakamura 1.0 1.0

1. Published together with E6
   Elastic proton scattering from 4He at 297 MeV
   M. Yoshimura et al., Phys. Rev. C **63** (2001) 034618

E40 Study of highly excited tates of ^{12}C by proton inelastic scattering.
Shintaro Nakayama 2.0 2.0

E41 Measurements for the spin rotation parameters of the proton elastic scateering at intermediate energies
Masaru Yosoi 2.0 2.0

1. New Data Acquisition System for the Focal Plane Polarimeter of the Grand Raiden Spectrometer.
   A. Tamii et al., IEEE Trans. Nucl. Sci. **43** (1996) 2488-2491.
2. Master thesis, Atsushi Tamii, Kyoto University, March 1994
   Measurement of Spin Rotation Parameters in Proton Elastic Scatterin from ^{58}Ni at E$_p$= 300 MeV

E42 Study of NN amplitudes in nuclei by knockout of 1s1/2 protons
Tetsuo Noro 8.5 8.5

1. Exclusive Measurement of proton quasifree scattering and density dependence of the nucleon-nucleon interaction
   Hatanaka et al., Phys. Rev. Lett. **78** (1997) 1014
2. Master thesis, M. Tanaka, Osaka University, March 1995
   Study of NN interaction in nuclei by using (p,2p) reactions
3. Master thesis, T. Baba, Osaka University, March 1997
   Study of NN interaction in nuclei by (p,2p) reactions
   – by using new trigger system with programable gate array –

E44 Development and test of a spectrometer for measurements of (p,p') continua
Yusuke Uozumi 1.5 1.5

1. Application of Tail Subtraction Technique with Particle Identification to a Stacked Spectrometer for Intermediate Energy Protons
   H. Murohka et al., J. Nucl. Sci. Technol. **34** (1997) 708-713
2. Master Thesis, Michihiro Yamashita, Kyushu University, February 1994
   Developments of proton detectors at intermediate energies.
3. Master Thesis, Hironori Matsumoto, Kyushu University, February 1994
   Measurements of light ion spectra at intermediate energies.

E46 Quasifree processes in the ^{6}Li breakup reactions by alpha particles
Akira Okihana 4.0 4.0

1. Quasifree processes in the ^{6}Li breakup reactions by alpha particles
   A.Okihana et al., Nucl. Phys. **A 614** (1997) pp.71-85

E52 Study of Highly Excited States by (^{7}Li, ^{7}Be-γ) Reactions.
Shintaro Nakayama 6.0 6.0

1. GSO-detector system "NYMPHS" for (^{7}Li,^{7}Be-γ) reaction at intermediate energies
   S. Nakayama et al., Nucl. Instru. Meth. **A 404** (1998) 34-40
2. Gamow-Teller transitions in (^{7}Li,^{7}Be) reaction at 65 AMeV
   S, Nakayama et al., Phys. Rev. C **60** (1999) 047303 (4)
3. Soft Dipole Resonance in the Neutron-Skin Nucleus ^{6}He
   S. Nakayama et al., Phys.Rev. Lett. **85** (2000) 262-265
4. published with E99
   Dipole excitation of α clusters in ^{6}Li and ^{7}Li
   S. Nakayama et al., Phys. Rev. Lett. 87 (2001) 122502

E53 Microscopic Structure of the Gamow-Teller States in ^{58}Ni
Mamoru Fujiwara 5.5 5.5

1. Isospin decomposition of the Gamow–Teller strength in ^{58}Cu
   Y. Fujita et al., Phys. Lett. **B 356** (1996) 29-34.

E54 (^{3}He, t) Charge-Exchange Reactions and Giant Resonances
Mamoru Fujiwara 6.0 6.0

1. Atomic Charge Exchange between fast Singly- and Doubly-Ionized Helium Ions in Targets from Carbon to Bismuth at β=0.36
   K. Dennis et al., Phys. Rev. A **50** (1994) 3992-3999.
2. Fragmentation and splitting of Gamow-Teller resonances in Sn(^{3}He,t)Sb charge-exchange reactions, A=112-124
   K. Pham et al., Phys. Rev. C **51** (1995) 526-540.
3. Enhancement of the Isovector $M1$ Strength in ^{28}Si due to Meson Exchange Currents
   P. von Neumann-Cosel et al., Phys. Rev. C **55** (1997) 532-534.
4. Isospin and spin-orbit structure of $J^{\pi}=1^{+}$ states excited in ^{28}Si
   Y. Fujita et al., Phys. Rev. C **55** (1997) 1137-1145.
5. GT Strengths Studied by (^{3}He,t) Reactions and Nuclear Matrix Elements for Double Beta Decays
   H. Akimune et al., Phys. Lett. **B 394** (1997) 23-28.
6. Excitation of Isovector Spin-Dipole Resonance and Neutron Skin of Nuclei
   A. Krasznahorkay et al., Phys. Rev. Lett. **82** (1999) 3216–3219
7. Spin-isospin giant resonances by charge-exchange reactions
   M. Fujiwara, in book "Nucleon-Hadron Many Body Systems from Hadron-Meson to Quark-Lepton Nuclear Physics" Oxford Science Publications, edited by H. Ejiri and H. Toki (1999) 50–77.
8. GT Strengths Studied by (^{3}He,t) Reactions and Nuclear Matrix Elements for Double Beta Decays
   H. Akimune et al., Phys. Lett. **B 394** (1997) 23–28.
9. Master thesis, Naotoshi Takemura, Osaka University, March 1995
   Study of microscopic structures of spin isospin excited states in ^{24}Al by ^{24}Mg(^{3}He,t-p)^{23}Mg reaction.
10. Master thesis, Izuru Daito, Osaka University, March 1995
    Gamow-Teller strength of solar neutrino detector 71Ga.
11. Doctor thesis, Izuru Daito, Osaka University, June 1998
    Gamow-Teller strengths from charge-exchange reactions on light nuclei and mirror asymmetry in the A=10 system

E56 Measurements for the deep hole states by the particle correlation.

Harutaka Sakaguchi 6.0 6.0

1. Master thesis, Shinichi Toyama, Kyoto University, March 1995
   Study of the (p,2p) reaction via 300 MeV polarized protons 300 MeV

E57 Calibration of the neutron polarimeter and polarization transfer measurements $D_{NN}(0°)$ for ^{26}Mg, ^{27}Al, ^{90}Zr $(\vec{p},\vec{n})$ reactions

Hideyuki Sakai 10.0 10.0

1. Gamow-Teller strength of ^{90}Nb in the continuum studied via multipole decomposition analysis of the ^{90}Zr(p,n) reaction at 295 MeV
   T. Wakasa et al., Phys. Rev. C **55** (1997) 2909 - 2922
2. Strength observed in Gamow-Teller resonance plus continuum in the ^{27}Al(p,n) reaction at 295 MeV.
   T. Wakasa et al., Phys. Lett. **B 426** (1998) 257-262.
3. Master thesis, Kentaro Yako, University of Tokyo, March 1999
   Study of Effective NN Interaction in Nuclei via the ^{28}Si(p,n)^{28}P(6^-) Reaction at 295 MeV.

E59 Measurements of all of polarization transfer coefficients for (p,n) quasi elastic scattering

Hideyuki Sakai 35.5 35.5

1. Performance of the neutron polarimeter NPOL2 for $(\vec{p},\vec{n})$ polarization transfer measurements
   T. Wakasa et al., Nucl. Instr. Meth. **A 404** (1998) 355 - 372
2. Polarization transfer and spin response functions in quasielastic $(\vec{p},\vec{n})$ reactions at 346 MeV.
   T. Wakasa et al., Phys. Rev. C **59** (1999) 3177-3195
3. Doctor thesis, Tomotsugu Wakasa, University of Tokyo, March 1997
   Study of nuclear isovector spin responses from polarization transfer in (p,n) reactions at intermediate energies
4. Master thesis, Takamasa Nonaka, University of Tokyo, March 1997
   Measurements of polarization transfer coefficients in ^{2}H$(p,n)pp$ reaction.

E63 Study of direct and statistical proton decay from the Gamow-Teller resonance in ^{90}Nb

Mamoru Fujiwara 7.0 7.0

1. Doctor thesis, K. Pham, University of Michigan. October 1997
   Giant spin-isospin resonances in ^{90}Nb from the ^{90}Zr(^{3}He,t)^{90}Nb(p)^{89}Zr charge-exchange reaction

E65 Microscopic Structure of Spin-Isospin Excitations in Nuclei by neutron decay studies

Mamoru Fujiwara 9.0 9.0

1. Particle decays from ^{12}B and ^{12}N mirror nuclei
   T. Inomata et al., Phys. Rev. C **57** (1998) 3153-3166.
2. Doctor thesis, Toru Inomata, Osaka University, June 1998
   Particle decays from ^{12}B and ^{12}N mirror nuclei

E68 Study of Spin-Multi Mode by (^{6}Li, ^{6}He) Reactions.

Kenji Katori 4.0 4.0

1. (^{6}Li,^{6}He) reaction at 100 MeV/nucleon as a probe of spin-excitation strengths
   H. Ueno et al., Phys. Lett. **B 465** (1999) 67-73

E69 Measurements for the spin rotation parameters in the proton elastic scattering.

Harutaka Sakaguchi 8.0 8.0

1. Master thesis, Tomoko Taki, Kyoto University, March 1998
   Measurements for the spin rotation parameters in the elastic scattering of 300 MeV polarized protons

2. Published together with E109.

E71 Spin-transfer measurement for (p,2p) reactions and in-medium NN interactions
Tetsuo Noro 22.0 22.0
1. Doctor thesis, M. Kawabata, Osaka University, September 1997
A study of nucleon-nucleon interaction in nuclei through s-state proton knockout reaction
Current status: Data analysis was completed. A paper is under preparation.

E73 A Study of High Energy Radiative Processes in Proton-Proton Collisions at 400 MeV
Yoshimasa Yuasa 4.0 4.0
1. Published together with E103
Measurement of proton-proton bremsstrahlung at 389 MeV
K. Yasuda et al., Phys. Rev. Lett. **82** (1999)

E74 Development of a simple position counter of spectrometers to measure continuum spectra
Masaru Matoba 2.0 2.0
1. T. Sakae et al., Housha-sen、VOL. **24**, No.2 (1998)

E75 Test experiment for a study of (p,p'x) pre-equilibrium process
Yusuke Uozumi 2.0 2.0
1. Master thesis, Hironobu Yoshida, Kyushu University, February 1996
Simulation of peak efficiencies of stacked NaI(Tl)spectrometer.

E77 Behavior of impurity ions and atoms in superfluid helium
Noriaki Takahashi 5.0 5.0
1. Preformance of Fragment Separator with Homogeneously Thick Energy Degrader:
A Highly Flexible System for Use with Degraders in a Wide Thickness Range
S. Mitsuoka et al., Nucl. Instr. Meth. **A 372** (1996) 489-500
2. Snowballs of Radioactive Ions - Nuclear Spin Polarization of Core Ions
N. Takahashi et al., Z. Physik **B 98** (1995) 347-351
3. Freezing-out of Nuclear Polarization in Radioactive Core Ions of Microclusters, "Snowballs" in Superfluid Helium
N. Takahashi et al., Hyperfine Interactions **97/98** (1996) 469-477.
4. Physics of Snowballs — Impurity Ions in Superfluid Helium
N. Takahashi and T. Shimoda, Nucleon-Hadron Many-Body Systems,
Ed. by H. Ejiri and H. Toki,vOxford University Press (1998), pp.190-209.
5. Doctor thesis, Shin-ichi Mitsuoka, Kyushu University, March 1997
Mechanism of ^{9}Be(^{14}N,^{12}B) Reaction at 39.3 MeV/u Leading to Large Spin Polarization of ^{12}B

E79 Study of γ decay of the Gamow-Teller Resonances in ^{90}Nb
Mamoru Fujiwara 8.0 8.0
Current status: Preparing for a paper to be submitted.

E80 Nuclear Spin Isospin Resonances for Solar Neutrinos
Hiroyasu Ejiri 4.0 4.0
1. Nuclear Spin Responses for Neutrinos in Astroparticle Physics.
H. Ejiri, Int. Journal of Modern Physics, **E 6** (1997) 1-43
2. Spin Isospin Responses of ^{71}Ga for Solar Neutrinos Studied by ^{71}Ga(^{3}He,tγ)^{71}Ge Reaction.
H. Ejiri et al, Phys. Lett. **B 433** (1998) 257-262.
3. Master thesis, Katsuhiko Ishibashi, Osaka University, March 1997
Spin Isospin Responses of ^{71}Ga for Solar Neutrino.

E81 Fragmentation of Deep Hole States in Light Nuclei

Hidenori Toyokawa 4.0 4.0

1. Published together with E110
   Structure and decay of the s-hole state in ^{11}B studied via the ^{12}C$(p, 2p)^{11}$B* reaction.
   M. Yosoi et al., Phys. Lett. **B 551** (2003) 255-261.

E82 Coincident proton emission from the continuum in the reactions ^{12}C$(p, p'p'')$ and ^{40}Ca$(p, p'p'')$ at an incident energy of 400 MeV

Tetsuo Noro 4.0 4.0

1. Rescattering in knockout reactions as manifested in ^{40}Ca$(p, p'p'')$ at an incident energy of 392 MeV
   A.A. Cowley et al., Phys. Rev. C **57** (1998) 3185-3190.
2. Inclusive ^{40}Ca$(p, p'x)$ at an incident energy of 392 MeV
   A. A. Cowley et al., Phys. Rev. C **62** (2000) 064604-1–5

E84 Microscopic Structure of Spin-Isospin Excited States in ^{13}N

Mamoru Fujiwara 5.0 5.0

1. Master thesis, Hisako Fujimura, Osaka University, March 1997
   Microscopic structure of spin isospin excited states in ^{13}N.
2. Doctor thesis, Hisako Fujimura, Osaka University, March 2002
   Nuclear structure of the spin-isospin excited states in ^{13}N studied via the ^{13}C(^{3}He,t) and ^{13}C(^{3}He,tp) reaction at 450 MeV

E85 "Is there an Isospin Wave" in a nucleus?

Masayoshi Tanaka 2.0 2.0

1. Master Thesis, Hideki Kohri, Osaka University, March 1997
   Spin-isospin excitation for (^{7}Li,^{7}Be) reaction

E87 Measurements of Detection Efficiencies of Cosmic Ray Neutron Detectors

Yasushi Muraki 4.0 4.0

1. Detection efficiency of a new type of solar neutron detector calibrated by an accelerator neutron beam.
   H. Tsuchiya et al., Nucl. Instr. Meth., **A 463** (2001) 183-193
2. Detection efficiency of a neutron monitor calibrated by an accelerator neutron beam.
   S. Shibata et al., Nucl. Instr. Meth., **A 463** (2001) 316-320
3. Attenuation of neutrons in the atmosphere and a thick carbon target
   T Koi et al., Nucl. Instr. Meth., **A 469** (2001) 63-69

E88 Development and test of large NaI(Tl) scintillator for study of continua

Yusuke Uozumi 2.0 2.0

1. Light Output Response of GSO(Ce) and NaI(Tl) to Protons up tp 160 MeV
   K. Anami et al., Mucl. Instr. Meth. **A 404** (1998) 327-333
2. Absolute efficiency of a stacked GSO(Ce) spectrometer for intermediate energy protons
   H. Yoshida et al., Nucl. Instr. Meth. **A 411** (1998) 46
3. Doctor thesis, Hiroki Murooka, Kyushu University, January 1997
   Development of stacked spectrometer and reaction cross section measuments at intermediate energies.
4. Master thesis, Kenji Anami, Kyushu University, February 1997
   Developments of GSO spectrometer to detect intermediate energy protons.

E90 Reaction Mechanism of ^{6,7}Li Breakup at Intermediate Energies

C. Samanta 3.0 3.0

1. Energy dependence in ^{6}Li-nucleus interactions at intermediate energies
   C. Samanta et al. Jour. Phys. G: Nucl. and Part. **23** (1997) 1697-1705.

E93 Radiative Electron Capture by Fast $^{3}He^{++}$ Projectiles
Yoshitaka Fujita 1.0 1.0
Current status: in combination with the results obtained in E162 (proposal by Sujkowski et al.), a paper is in preparation

E95 Cross sections at 0° for pp → pp($^{1}S_0$) + π^0 and pn → pp($^{1}S_0$) + π^- at 300, 320 and 350 MeV
Nobuyuki Matsuoka 10.0 10.0
1. Master thesis, Yoshikazu Maeda, Osaka University, March 1997
Differential cross sections for p+p → pp($^{1}S_0$)+π^0 and p+n → pp($^{1}S_0$)+π^- reactions at T_p=300, 318.5, 345 and 390 MeV
2. Doctor thesis, Yoshikazu Maeda, Osaka University, March, 2000
Pion Production Mechanism in Nucleon-Nucleon Collisions

E96 Measurement of Polarization Transfer Coefficients via proton inelastic scattering at zero degrees
Atsushi Tamii 10.0 10.0
1. Polarization transfer observables for proton inelastic scattering from ^{12}C at 0°
A. Tamii et al., Phys. Lett. **B 459** (1999) 61-66.
2. Doctor thesis, Atsushi Tamii, Kyoto University, September 1999
Polarization transfer observables for proton inelastic scattering from ^{12}C at zero degrees
3. Master thesis, Takahiro Kawabata, Kyoto University, March 1998
Measurement of Polarization Transfer Observables in Proton Inelastic Scattering from ^{28}Si at 0°

E97 Study of γ-decay of the Spin Dipole Resonance in ^{208}Bi
Mamoru Fujiwara 7.0 7.0
1. Direct Proton Decay from Spin-Dipole Resonance in ^{208}Bi
H. Akimune et al., Phys. Rev. C **61** (2000) 011304R, 1–4

E98 Determination of the NN Amplitude in Nuclear Field by Means of ($\vec{p}$,p$\vec{p}$) Reaction
Tetsuo Noro 20.0 10.0
1. Master thesis, H. Yoshida, Osaka University, March 1998
Development of focal plane polarimeter for study of in-medium NN interaction by ($\vec{p}, p\vec{p}$) reactions
Current status: Hardware was completed. So far, calibration data by using p-p scattering and a part of Dnn data for (p,2p) reaction was taken. Software development by usign the former data is in progress.

E99 Isovector Giant Resonances in ^{58}Ni Studied by the (^{7}Li, ^{7}Be-γ) Reaction
Shintaro Nakayama 8.0 8.0
1. Isovector Electric Monopole Resonance in ^{60}Ni
S. Nakayama et al., Phys. Rev. Lett. **83** (1999) 690-693
2. Dipole excitation of α clusters in ^{6}Li and ^{7}Li
S. Nakayama et al., Phys. Rev. Lett. 87 (2001) 122502

E101 Background Survey in the ^{9}Be(p,pΛ) Reaction at E_p = 400 MeV
Tadafumi Kishimoto 4.0 4.0
1. Master thesis, Hisako Hayakawa, Osaka University, March 1997
Feasibility study of the experiment to measure the pn → p Λ reaction

E102 Neutron Decay from Isovector States in ^{12}B populated by (^{7}Li, ^{7}Be-γ,n) Reactions on ^{12}C
Masayoshi Tanaka 10.0 10.0
1. Master Thesis, Yoshiki Yamamoto, Konan University, March 1999
Neutron decay from ΔS=1 and ΔS=0 isovector states excited by the $^{12}C(^{7}Li,^{7}Be,\gamma)^{12}B$ reaction at 65 MeV/nucleon

E103 A Study of High Energy Radiative Processes in Proton-Proton Collisions at 392 MeV
Masaharu Nomachi 10.0 10.0
1. Measurement of proton-proton bremsstrahlung at 389 MeV
K. Yasuda et al., Phys. Rev. Lett. **82** (1999)
2. Master thesis, Masashi Kato, Osaka University, March 1998
Study of proton-proton bremsstrahlung at high energy.
3. Doctor thesis, Yoshimasa Yuasa, Osaka University, September 1998
The proton-proton bremsstrahlung at intermediate energy region
4. Doctor thesis, Keisuke Yasuda, Kyoto University, 1999
Measurement of proton-proton bremsstrahlung at 389 MeV

E105 Test experiment for the production of high spin-polarized ^{12}N via the spin-transfer ^{12}C($\vec{p}$, $^{12}\vec{N}$)n reaction aiming to search for the right-handed weak currents in future
Hideyuki Sakai 2.0 2.0

E106 Quasi-free pion production process in ^{2}H(p,d)π^{+}n and ^{2}H(p,dπ^{+})n reactions at 400 MeV
Nobuyuki Matsuoka 6.0 6.0
Current status: Due to insufficient bias voltage of the VDC of LAS for the detection of pions, the detection efficiency is not good, and reasonable correction of it was found to be very difficult. At present, we cannot proceed the data analysis anymore.

E107 Reaction Mechanism of ^{6,7}Li Breakup at Intermediate Energies
C. Samanta 9.0 9.0
1. Reaction Mechanism of ^{6}Li Scattering at 600 MeV
K. Schwarz et al., Eur. Phys. J. **A 7** (2000) 367–375.
2. Doctor thesis, Kilian Schwarz, July 2001

E108 Study of the ΔL = 0 Giant Resonances in ^{58}Ni via Proton Inelastic Scattering at and near Zero Degrees
Masaru Yosoi 8.0 8.0
1. Master thesis, Takatsugu Ishikawa, Kyoto University, March 1999
Study on the giant resonances with zero degree polarized proton scattering off ^{58}Ni

E109 Measurement of Spin Rotation Parameter of Proton Elastic Scattering
Hiroyuki Takeda 12.0 12.0
1. Doctor thesis, Hiroyuki Takeda, Kyoto University, 2002
Modification of nucleon–nucleon interactions in nuclear medium and neutron densities extracted via proton elastic scattering at intermediate energies
2. To be published in Memoirs of the Faculty of Science, Kyoto University, Series of Physics, Astrophysics, Geophysics and Chemistry

E110 Fragmentation of Deep Hole States in Light Nuclei
Hidenori Toyokawa 9.0 9.0
1. Structure and decay of the s-hole state in ^{11}B studied via the ^{12}C$(p,2p)^{11}$B* reaction.
M. Yosoi et al., Phys. Lett. **B 551** (2003) 255-261.
2. Master thesis, Naohiko Tsukahara, Kyoto University, March 2000
Particle decay fom ^{11}B(s-hole),^{15}N(s-hole) states.
3. Doctor thesis, Masaru Yosoi, Kyoto University, 2003
Structures and fragmentations of the deep-hole states in ^{11}B and ^{15}N

E112 Test experiment for the inelastic scattering of alpha particles around zero degrees and the giant monopole resonance
Harutaka Sakaguchi 6.0 6.0

1. Master thesis, Makoto Uchida, Kyoto University, March 2000.
   Isoscalar Giant Dipole Resonance in 208Pb excited via alpha particle
   inelastic scattering.
2. Compressional-mode giant resonances in deformed nuclei.
   M. Itoh et al., Phys. Lett. B **549** (2002) 58
3. Isoscalar giant dipole resonance in ^{208}Pb via inelastic α scattering at 400 MeV
   and nuclear incompressibility.
   M. Uchida et al., Phys. Lett. B **557** (2003) 12
4. Doctor Thesis, Masatoshi Itoh, Kyoto University, 2003.
   Compressional-mode giant resonances in deformed nuclei.

E113 Study of isospin structure by the comparison of (^{3}He,t) and (p,p') reactions
Yoshitaka Fujita 2.0 2.0

1. Mirror-symmetry structure of $A = 27$, $T = 1/2$ nuclei studied through strong, weak,
   and electromagnetic interactions
   Y. Fujita et al., Phys. Rev. C **59** (1999) 90-100
2. Separation of isoscalar, isovector, orbital and spin contributions in $M1$ transitions
   in mirror nuclei
   Y. Fujita et al., Phys. Rev. C **62** (2000) 044314 1-9.
3. Ion-Optical Matching Conditions Realizing Good Resolution in Using a Magnetic
   Spectrometer
   Y. Fujita et al., J. Mass Spectrom. Soc. Jpn. **48(5)** (2000) 306-311.
4. Better-resolution measurement of vertical scattering angle in a new ion-optical mode of
   spectrometer "Grand Raiden"
   H. Fujita et al., Nucl. Instrum. and Meth. in Phys. Res. **A 469** (2001) 55-62
5. Gamow-Teller transitions from ^{58}Ni to discrete states of ^{58}Cu
   -The study of isospin symmetry in atomic nuclei-
   Y. Fujita et al., Eur. Phys. J. A **13** (2002) 411-418.
6. Total absorption spectroscopy of ^{58}Cu decay
   Z. Janas et al., Eur. Phys. J. A **12** (2002) 143-145.
7. Realization of matching conditions for high-resolution spectrometers
   H. Fujita et al., Nucl. Instrum. Meth. in Phys. Res. A484 (2002) 17-26
8. Doctor thesis, Hirohiko Fujita, March 2002
   Isospin symmetry structure of spin-isospin excitations in $A = 58$ nuclei
9. Master thesis, Yuichi Kanzaki, Osaka University, March 1999
   Gamow-Teller strength in mass-26 nuclei by high resolution ^{26}Mg(p, p'), ^{26}Mg(^{3}He,t) reaction
   an isospin structure of $M1$ states.
10. Master thesis, Yoshihiro Shimbara, March 2000
    Identification of isospin quantum numbers in $A = 25$ mirror nuclei
    by comparing (p, p') and (^{3}He,t) reaction.

E114 Study of effective nuclear interactions using charge-exchange reactions on targets of ^{12}C, ^{13}C and ^{14}C
J. Jänecke 2.0 2.0

E116 Systematic study of pre-equilibrium mechanisms of (p,p'x) reactions at 300-400 MeV
Yusuke Uozumi 3.5 3.5

1. Doctor thesis, Hironobu Yoshida, Kyushu University, January 1999
   Developments of stacked GSO spectrometer and measurements of cross sections
   for proton inelastic scatterings at 400 MeV.
2. Light Response of large GSO and stacked GSO to intermediate energy protons
   S. Aoki, et al., IEEE Trans. NS vol. **47** (2000) 1798-1801.
3. Study of proton and deuteron spectra from proton induced reactions at intermediate energies
   F.Saiho et al., Journal of Nuclear Science and Technology, supplement 2 (2002) 246-249.

4. Proton production cross section for reactions induced by 300- and 392-MeV protons
   Y. Uozumi et al., Journal of Nuclear Science and Technology, supplement 2 (2002) 385-388

E119 Measurement of Magnetic Dipole and Electric Quadrupole Moments of Ground State of ^{16}N
Hideaki Izumi 12.0 12.0
1. Impurities in Superfluid Helium Detected via Radioactivity
   N. Takahashi et al., Physica **B 284-288** (2000) 89-90.
2. Master thesis, Yoshikazu Hirayama, Osaka University, March 2000
   Behavior of radioactive impurities in superfluid helium
3. Master thesis, Mao Asai, Osaka University, March 2001
   Study of Turbulence in Superfluid Helium by Using Radioactive Nuclear Beams
4. Master thesis, Motohisa Nakamura, Osaka University, March 2001
   Study of Spin Relaxation of Radioactive Nucleus Implanted into Superfluid Helium

E120 Test of CDC and SSD-Tracker Prototypes for the pn $\rightarrow$ pΛ experiment
Atsushi Sakaguchi 3.0 3.0
1. Master thesis, Shizu Minami, Osaka University, March 1999
   Performance of SSD and Collimator for the pn $\rightarrow$ pΛ Experiment
2. Master thesis, Tomohito Mori, Osaka University, March 1999
   Performance of CDC for the pn $\rightarrow$ pΛ Experiment

E122 Study of weak hyperon nucleon interaction by the pn $\rightarrow$ pΛ reaction
Tadafumi Kishimoto 15.0 13.0
1. Master thesis, Kazuki Wakae, Osaka University, March 2000
   Trigger counter for the pn $\rightarrow$ pΛ reaction and its performance
2. Master thesis, Tatsuto Kanie, Osaka University, March 2000
   Characteristics of Cyrindorical Drift Chamber for the pn $\rightarrow$ pΛ Experiment
3. Master thesis, Tetsuro Itabashi, Osaka University, March 2002
   Development of Trigger Counters for the pn $\rightarrow$ pΛ Experiment
4. Master thesis, Takashi Nagao, Osaka University, March 2002
   Performance of the Cylindrical Drift Chamber for the pn $\rightarrow$ pΛ Experiment
5. Master thesis, Takashi Numata, Osaka University, March 2003
   Estimation on Vertex Resolutions of Cylindrical Drift Chamber for p n $\rightarrow$ p Λ Experiment

E123 A test experiment of proton-proton Bremsstrahlung process with GSO spectrometers
Masaharu Nomachi 2.0 2.0

E125 π^- production in proton - nucleus collision
Kichiji Hatanaka 12.0 12.0
1. ^{12,13}C$(p,\pi^-)^{13,14}$O$_{g.s.}$ Reactions in the Δ_{1232} Resonance Region
   K. Hatanaka et al., Phys. Rev. C **65** (2002) 014609.
2. Master thesis, Junichiro Kamiya, Osaka University, March 2000
   ^{12,13}C$(\vec{p},\pi^-)^{13,14}$O$_{g.s.}$ and ^{90}Zr$(\vec{p},\pi^-)^{91}$Mo Reactions at T$_p$=250, 300 and 346 MeV.

E126 Three-body force effects in p + d(pol) $\rightarrow$ ^{3}He + γ reaction
Kenshi Sagara 11.5 11.5
1. Doctor Thesis, Takanori Yagita, Kyushu University, April 2002
   Measurement of analyzing powers and cross section in p-d radiative capture reaction at 200 MeV
Current status: In preparation for submission to Physical Review C

E127 Development of d-beam polarimeters
Kenshi Sagara 10.5 10.5
1. Doctor Thesis, Takanori Yagita, Kyushu University, April 2002

Measurement of analyzing powers and cross section in p-d radiative capture reaction at 200 MeV

Current status: The polarimeter for a 200 MeV d-beam has been completed. The performance will be published together with the results of E126.

E128 Search for the tetraneutron via ^{7}Li(^{7}Li,^{10}C)4n reaction
Tamio Yamagata 3.0 3.0

E131 Measurements of momemtum transfer dependence of polarization transfer and spin response functions in quasi-elastic $(\vec{p},\vec{n})$ reactions
Tomotsugu Wakasa 6.0 6.0
1. Cross sections and polarization observables for the ^{40}Ca(p,n) reactions at 345 MeV and multistep contributions in the continuum
T. Wakasa et al., Phys. Rev. C **65** (2002) 034615

E132 Search for missing $1/2^+$ and $1/2^-$ states in ^{9}B using (^{3}He,t) reaction at 450 MeV
Hiroaki Utsunomiya 2.0 2.0
1. Evidence for a 3.8 MeV state in ^{9}B
H. Akimune et al., Phys. Rev. C **64** (2001) 041305(R)
2. Master thesis, Kaoru Yamazaki, Konan University, March, 1999

E133 Detailed investigation of the Isoscalar Giant Dipole Resonance
Umesh Garg 7.0 7.0
1. Master thesis, Makoto Uchida, Kyoto University, March 2000.
Isoscalar Giant Dipole Resonance in 208Pb excited via alpha particle inelastic scattering.
2. Compressional-mode giant resonances in deformed nuclei.
M. Itoh et al. Phys. Lett. B **549** (2002) 58
3. Isoscalar giant dipole resonance in ^{208}Pb via inelastic α scattering at 400 MeV and nuclear incompressibility.
M. Uchida et al., Phys. Lett. B **557** 12
4. Doctor Thesis, Masatoshi Itoh, Kyoto University, 2003.
Compressional-mode giant resonances in deformed nuclei.

E135 Measurement of the neutron sensitivity of the Photon Catcher
Noboru Sasao 4.0 4.0
1. Master thesis, Tomoaki Nakamura, Kyoto University, February 1999
Development of a photon catcher used in the BNL E926 experiment

E136 Sample production for brute-force low-temperature nuclear orientation experiment
Susumu Ohya 2.0 2.0
1. Hyperfine anomalies of ^{95}Tc - ^{96}Tc and ^{106}Agm - ^{110}Agm using brute-force nuclear magnetic resonance on on oriented nuclei.
S. Ohya et al, Phys. Rev. C **63** (2001) 044314
2. Nuclear spin relaxation of extremely dilute impurities using brute-force NMRON
K. Nishimura et al. J. Phys. Jpn. Vol 71. No.6 (2002)
3. Master thesis, H. Sato, Niigata University, March,2001.
Measurement of hyperfine anomalies of ^{95}Tc - ^{96}Tc and ^{106}Agm - ^{110}Agm using Brute-Force NMR-ON
4. Master thesis, Y. Kawamura, Niigata University, March,2002.
Magnetic moment of 48Sc in the vicinity of double-closed ^{48}Ca

E137 Spin-isospin excitation modes in ^{16}O and ^{11}B nuclei via proton inelastic scattering at extremely fowward angles

Takahiro Kawabata 13.0 13.0

1. Thin ice target for $^{16}O(p,p')$ experiment
   T. Kawabata et al., Nucl. Instr. Methods **A 459** (2001) 171–176
2. Polarization transfer in the 16O(p,p') reaction at forward angles
   and structure of the spin-dipole resonances
   T.Kawabata et al., Phys. Rev. C **65**, 064316 (2002)
3. Doctor thesis, Takahiro Kawabata, Kyoto University, April 2002.
   Polarization transfer in the 16O(p,p') reaction at forward angles
   and structure of the spin-dipole resonances

E138 Commissioning the (n,p) facility
Hideyuki Sakai 15.0 15.0

1. Master thesis, Yukie Maeda, University of Tokyo, March 2001
   Study of Three Nucleon Forces by $\vec{n}$ + d scattering at 250 MeV

E139 Study of inclusive (p,p') reaction continua at intermediate energies
Yusuke Uozumi 3.0 3.0

1. Master thesis, Hiroyuki Tanaka, Kyushu University, March 2001
   Cross section of (p,p ′ x) reaction at 300 MeV.
2. Master thesis, Huminobu Saho, Kyushu University, March 2001
   Cross section of deuteron broduction by proton-nucleus collision at 300 MeV.
3. Possible contribution of a highly excited collective state to proton-nucleus
   multistep interactions at 300 MeV
   Y. Uozumi et al., Phys. Rev. C, **64** (2002) 011601
4. Proton production cross section for reactions induced by 300- and 392-MeV protons
   Y. Uozumi et al., Journal of Nuclear Science and Technology, supplement 2 (2002) 385-388

E140 Measurement of analyzing power for the $pp \to pp\pi^0$ reaction
Keisuke Yasuda 6.0 6.0

1. Master thesis, Mariko Segawa, Osaka University, March 2001
   The measurement of the proton-proton bremsstrahlung at 390 MeV.

Current status : Data analysis was finished and publication for Nucl. Phys. A
is in preparationand will be submitted soon.

E141 High resolution study of deeply bound pionic states in ^{207}Pb by (p,2p) reaction
Kichiji Hatanaka 4.0 4.0
Current status: Cross section is found to be $2.7(0.2 + 1.0)$ μ b/ sr^2 /MeV at 25.5 °.

E142 Measurement of the elastic and inelastic scattering in alpha particles for the analysis
of the giant resonances
Masatoshi Itoh 9.0 9.0

1. Master thesis, Makoto Uchida, Kyoto University, March 2000.
   Isoscalar Giant Dipole Resonance in 208Pb excited via alpha particle
   inelastic scattering.
2. Compressional-mode giant resonances in deformed nuclei.
   M. Itoh et al. Phys. Lett. B **549** (2002) 58
3. Isoscalar giant dipole resonance in ^{208}Pb via inelastic α scattering at 400 MeV
   and nuclear incompressibility.
   M. Uchida et al., Phys. Lett. B **557** 12
4. Doctor Thesis, Masatoshi Itoh, Kyoto University, 2003.
   Compressional-mode giant resonances in deformed nuclei.

E144 Polarization measurement in elastic scattering of ^{6}Li and ^{12}C from polarized ^{3}He internal
gas target at E=72 MeV/u

Hideki Ueno 5.0 5.0

1. Master thesis, Toshio Shinada, Osaka University, March 1999
   Developments of a polarized 3He gas target to study spin-orbit interactions
   in neutron rich nuclei.
2. Master thesis, Kazunori Harada, Osaka University, March 2000
   Developments of a polarized 3He gas target to study spin-orbit force
   in optical potentials.

E145 Study of isovector resonances in ^{90}Zr by (^{7}Li,^{7}Be) reaction
Shintaro Nakayama 8.0 8.0

E146 $\vec{p}d$ elastic scattering at 250 and 400 MeV
Kichiji Hatanaka 8.0 8.0

1. Cross section and complete set of proton spin observables in $\vec{p}d$ elastic scattering at 250 MeV.
   K. Hatanaka et al., Phys. Rev. C **66** (2002) 044002 (10 pages)
2. Master thesis, Daisuke Hirooka, Osaka University, March 2001
   Study of Three Nucleon Forces by $\vec{p} + d$ Elastic Scattering
3. Master thesis, Youhei Shimizu, Osaka University, March 2002
   Study of Three Nucleon Forces by $\vec{p} + d$ Elastic Scattering

E147 Extraction of the differences for neutron density distributions in ^{116}Sn, ^{118}Sn and ^{120}Sn
Harutaka Sakaguchi 11.0 11.0

E148 Neutron and γ decay from hole states in light nuclei
Masaru Yosoi 5.0 5.0

1. Doctor thesis, Masaru Yosoi, Kyoto University, 2003.
   Structures and fragmentations of the deep-hole states in ^{11}B and ^{15}N.

Current status: Publication is in preparation combined with E110.
Data analysis for γ decay is still in progress.

E149 Search for the β^+ Gamow-Teller strength in the continuum for (n, p) reactions at 300 MeV
Kentaro Yako 27.0 27.0

1. Doctor thesis, Kentaro Yako, University of Tokyo, September 2002.
   Precise determination of the Gamow-Teller quenching factor via the 90Zr(n,p) reaction
   at 293 MeV.

Current status: Data taking is finished. Data analysis is in progress.

E151 Continuing investigation of the *isoscalar* giant dipole resonance
Umesh Garg 14.0 14.0

1. Master thesis, Makoto Uchida, Kyoto University, March 2000.
   Isoscalar Giant Dipole Resonance in 208Pb excited via alpha particle
   inelastic scattering.
2. Compressional-mode giant resonances in deformed nuclei.
   M. Itoh et al. Phys. Lett. B **549** (2002) 58
3. Isoscalar giant dipole resonance in ^{208}Pb via inelastic α scattering at 400 MeV
   and nuclear incompressibility.
   M. Uchida et al., Phys. Lett. B **557** 12
4. Doctor Thesis, Masatoshi Itoh, Kyoto University, 2003.
   Compressional-mode giant resonances in deformed nuclei.

E152 Measurements of intermediate energy neutron transport through materials
Kazuo Shin 1.0 1.0

Current status: Data taking is finished. Data analysis is in progress.

E153 Study of behavior of impurities in superfluid helium
Tadashi Shimoda 12.0 0.0
Current status: Not performed yet. Newcomers are being trained.

E154 Study of three-body force via the measurement of spin correlation coefficients $C_y^{y',y'}$ and $C^{y',y'}$ in $p+d$ elastic scattering
Atsushi Tamii 5.0 1.5
1. Master thesis, Nobuyuki Uchigashima, Univ. of Tokyo, March 2002
   Study of three-nucleon force via the measurement of polarization transfer coefficients in the ^{2}H$(\vec{p},\vec{d})$ elastic scattering at 400 MeV
   Current Status: The construction of a focal plane polarimeter of the LAS is in progress.

E155 High Resolution study of 0^- states in ^{16}O
Tomotsugu Wakasa 5.0 5.0
Current status: Paper preparation is in progress.

E156 Test experiment to observe nuclear medium effects on ρ-mesons via ^{40}Ca$(\vec{p},\vec{p}')$ reaction at E_p=300 MeV
Makoto Uchida 4.0 4.0
Current status:Data taking is finished. Data analysis is in progress.

E157 Study of the spin dependent ^{3}He-nucleus interaction at 450 and 300 MeV
Junichiro Kamiya 7.0 7.0
1. Calibration of the effective analyzing power for a ^{3}He polarimeter at 443 MeV.
   J. Kamiya et al. accepted for Nucl. Instr. Methods
2. Doctor thesis, Junichiro Kamiya, Osaka University, March 2003.
   Spin dependent ^{3}He-nucleus interaction at 450 MeV

Current status: in preparation for submission with the results of E182 and R39.

E158 Study of isospin structure by the comparison of (^{3}He,t) and (p,p') reactions
Yoshihiro Shimbara 5.0 5.0
1. $M1$ and Gamow-Teller transitions in $T=1/2$ nuclei ^{23}Na and ^{23}Mg
   Y. Fujita et al., Phys. Rev. C **66** (2002) 044313.
2. Master thesis, Tatsuya Adachi, Osaka University, March 2002.
   Study of isospin structures of $A=54$ nucleus by comparing $(^3\mathrm{He},t)$, (p,p') and (e,e') reactions.
3. Doctor thesis, Hirohiko Fujita, Osaka University, March 2002
   Isospin Symmetry Structure of Spin-Isospin Excitations in $A=58$ Nuclei
4. Analogous Gaomw-Teller and $M1$ transitions in ^{26}Mg, ^{26}Al, and ^{26}Si
   Y. Fujita et al., Phys. Rev. C **67** (2003) 064312.
5. Suppression of Gamow-Teller and $M1$ transitions in deformed mirror nuclei ^{25}Mg and ^{25}Al
   -Direct observation of K selection rule-
   Y. Shimbara et al., Eur. Phys. J. A, accepted for publication.

E159 High Resolution study of spin dipole excitation in ^{16}F via (^{3}He,t) reaction at 135 MeV/u
Georg P.A. Berg 4.0 4.0
Current status: Data taking is finished. Data analysis is in progress.

E160 Study of decay mode of the 1^+ states in ^{176}Lu after solar neutrino absorption via ^{176}Yb(^{3}He,t γ)^{176}Lu high resolution coincidence measurement
Keigo Hara 6.0 6.0
Current status: Measurements were finished.
Publication is in preparation combined with E173.

E161 Investigation of the isovector spin monopole resonance in ^{208}Bi and ^{90}Nb via the ^{208}Pb,

^{90}Zr(^{3}He,t+p) reactions
R.G.T. Zegers 9.0 9.0
1. Excitation and decay of the isovector giant monopole resonances via the ^{208}Pb(^{3}He,*tp*) reaction at 410 MeV
R. Zegers et al., Phys. Rev. Lett. **90** (2003) 202501

E162 Interaction of fast ^{3}He projectiles with solid targets
Ziemowid Sujkowski 4.0 4.0
Current status: Data taking is finished. Data analysis is in progress.

E163 Resonance states in proton rich nuclei and the reaction rates in the rp-process
Georg P.A. Berg 5.0 5.0
1. Master thesis, Yasuyuki Kitamura, Osaka University, March 2002
Feasibility study of (^{4}He, ^{6}He) transfer reaction related to the rp-process.

E164 Search for excited α-cluster states in ^{6}Li via ^{6}Li(^{7}Li,^{7}Be,d) reaction
Hidetoshi Akimune 5.0 5.0
1. Master thesis, Ayako Shiokawa、Konan University, March 2002
Evidence for t+t structure in ^{6}He

E165 Three-nucleon force effects in ^{2}H(p,p)np reaction
Kenshi Sagara 8.0 8.0
1. Master thesis, Shinya Nozoe, Kyushu University, March 2003.
Discrepancies in Cross Section and Ay of pd Breakup Reaction at E_p = 250 MeV.
Current status: Preliminary data have been obtained.
Further data analysis is in progress.

E168 Search for the deep hole 1s state in medium weight nuclei by (p,2p) reactions
Harutaka Sakaguchi 5.0 5.0
Current status: Measurements were just finished. Data analysis are in progress.

E169 Test measurement of coherent pion production in ^{12}C(p,n π^{+})^{12}C(g.s.) at E_p=400 MeV
Yasuhiro Sakemi 3.0 0.0

E170 Study of anomalous pion production in proton collisions with nuclear targets
Alexei B. Kurepin 10.0 10.0
1. Master thesis, Kunihiro Fujita, Osaka University, March 2003
Energy dependence of π-meson production in proton-nucleus scattering.
Current status: The measuremet of pion yield at 10 proton energies near 350 MeV in one MeV intervals was performed for 6 setting of pion energies from 19 to 125 MeV. A preliminary analysis revealed the deviation from a smooth energy dependence of pion yield in a narrow interval of proton energy.
The analysis is going at RCNP and INR, Moscow.

E171 Study of breakup mechanism of a loosely bound projectile in a region of Coulomb-breakup dominance
Hiroyuki Okamura 5.0 5.0
Current status: Experiment is just finished.

E172 Search for di-^{3}He structure in ^{6}Be via ^{6}Li(^{3}He,t,^{3}He) reaction
Tamio Yamagata 6.0 6.0
Current status: Experiment is just finished.

E173 Study of decay mode of the 1^{+} states in ^{176}Lu after solar neutrino absorption via

^{176}Yb(^{3}He,t γ)^{176}Lu high resolution coincidence measurement
Keigo Hara 10.0 10.0
Current status: Measurements were finished.
Publication is in preparation combined with E160.

E174 Response of stacked GSO detector to light charged particles
— Measurement of (p,dx) cross sections for nuclear data —
Yusuke Uozumi 2.5 2.5
1. Study of proton and deuteron spectra from proton induced reactions at intermediate energies
F.Saiho et al., Journal of Nuclear Science and Technology, supplement 2 (2002) 246-249.

E175 Study of Isovector Resonance in Nuclei by (^{7}Li,^{7}Be) Reaction
Shintaro Nakayama 5.0 5.0
Current status: Experiment is just finished.

E177 Nuclear Response for Double Beta Neutrinos and Double Spin Isospin Resonances
Keiji Takahisa 2.0 2.0
Current status: Experiment is just finished.

E178 Ultra Cold Neutron Production Experiment
Yasuhiro Masuda 5.0 5.0
1. Spallation Ultracold-Neutron Production in Superfluid Helium
Y. Masuda et al., Phys. Rev. Lett. **89** (2002) 284801

E179 Three-nucleon force effects in n+d elastic scattering at 250 MeV
Yukie Maeda 8.5 8.5

E180 Study of the pol-p + pol-^{3}He Elastic Backward Scattering at 200 - 400 MeV
Kichiji Hatanaka 10.0 0.0

E181 Observation of (p,2p) Reactions on Light Nuclei
Tetsuo Noro 4.5 4.5
Current status: Measurements were just finished. Data analysis are in progress.

E182 Study of the Spin Dependent 3He-Nucleus Interactions at 450 MeV
Junichiro Kamiya 10.0 10.0
1. Doctor thesis, Junichiro Kamiya, Osaka University, March 2003.
Spin dependent ^{3}He-nucleus interaction at 450 MeV
Current status: in preparation for submission with the results of E157 and R39.

E184 Search for tri-nucleon cluster structure in ^{6}Li
Shintaro Nakayama 4.0 4.0

E185 Fine Structure of the Gamow-Teller and Spin-Dipole Resonance in Heavy Nuclei
Peter VNC 5.0 5.0
Current status: Data takinbg finished, data analysis in progress, completion expected
within the next 6 months.

E186 Neutron decay from the spin-isospin resonances in ^{208}Bi via the ^{208}Pb(^{3}He,t+n) reaction
Mamoru Fujiwara 10.0 10.0
1. Master thesis, Kohsuke Nakanishi, Osaka University, March 2003
Neutron decay from the spin-isospin resonances in ^{208}Bi via the ^{208}Pb(^{3}He,t+n) reaction.
Current status:

E187 Resonance States in Proton Rich Nuclei and the Reaction Rates in the rp-Process
Georg P.A. Berg 7.0 7.0
1. Master thesis, Naoki Sakamoto, Osaka University, March 2003
24Mg(^{4}He, ^{6}He)22Mg and 28Si(^{4}He, ^{6}He)26Si reaction related to the rp-process.

E188 Investigation of the charged-particle decay of the Isoscalr Giant Dipole Resonance and the Isovector Giant Quadrupole Resonance
Umesh Garg 7.0 7.0

E189 Search for Alpha Cluster Condensation in ^{16}O
Tomotsugu Wakasa 4.0 4.0
Current status: Data taking is finished. Data analysis is in progress.

E190 Charged particle decay from analog of excited alpha-cluster state in ^{6,7}He
Hidetoshi Akimune 5.0 5.0

E191 Nuclear Responses for Double Beta Neutrinos and Double Spin Isospin Resonances
Keiji Takahisa 8.0 8.0

E193 Measurements of particle production cross sections for 400 MeV proton induced reactions on heavy nuclei
Yusuke Uozumi 3.0 3.0
Current status: Data analysis is in progress.

E196 Search for supernarrow dybarions via the p+d scattering
Atsushi Tamii 7.0 0.0

E197 Detailed study of Gamow-Teller strengths in T=1 fp shell nuclei
Tetsuya Adachi 5.0 5.0

E199 Measurements of intermediate energy neutron transport through materials
Shingo Taniguchi 2.0 2.0

E200 Continuing investigation of the isoscalar giant dipole resonances
Umesh Garg 5.0 5.0

E201 Study of Three Nucleon Force Effects via the n+d elastic scattering at 250 MeV
Yukie Maeda 9.5 9.5

E202 Search for alpha cluster excitation in ^{6,7}Li
Tamio Yamagata 3.0 3.0

E203 Precise measurement of pionic correlations in nuclei via ^{16}O(p,p)
Tomotsugu Wakasa 18.0 0.0

E204 Structure and decay of the s-hole state in ^{6}He
Masaru Yosoi 6.5 6.5

E205 Measurement of ^{208}Pb(p,2p)^{207}Tl reaction for examing a reliability of relativistic calculations
Tetsuo Noro 6.0 2.0

E206 Energy dependence of A_{xx} discrepancy in pd radiative capture
Kenshi Sagara 7.0 7.0

E207 Weak isoscalar response of ^{11}B
Takahiro Kawabata 5.0 5.0

E208 Study of Gamow-Teller transition strength by ^{37}Cl(^{3}He,t)^{37}Al
Yoshihiro Shimbara 2.5 2.5

E209 Search for the Gamow-Teller Strengths in ^{14}O via the ^{14}N(^{3}He,t)^{14}O reaction
Denis De Frenne 2.5 2.5

E210 Study of the GT strength distributions via ^{60,62,64}Ni(^{3}He,t)
Denis De Frenne 3.5 3.5

E212 Continuing investigation of the charged-particle decay of the isoscalar giant dipole resonance
Umesh Garg 8.0 8.0

E213 Measurement of particle production cross sections induced by 400 MeV protons on Gd, Ta, and W
Yusuke Uozumi 2.0 2.0

E214 Development of high-resolution halo-free beams for high-resolution inelastic scattering
Atsushi Tamii 4.0 2.0

E215 Three-nucleon effects in the $\vec{d}$ + p $\rightarrow$ (pn)$_{^1S_0}$ + p reaction at 200 MeV
Kichiji Hatanaka 6.0 5.0

E216 Extraction of neutron density distribution in the calcium isotopes
Hiroyuki Takeda 6.5 6.5

E217 Measurement of recoil momentum distribution of deep hole states in ^{40}Ca$(p, 2p)$ reaction
Yusuke Yasuda 6.0 0.0

E218 Determination of the Gamow-Teller unit cross section $\hat{}\sigma_{GT}$ at 300 MeV
Hideyuki Sakai 8.0 0.5

E219 The isovector spin monopole resonance in ^{90}Nb excited via the ^{90}Zr(^{3}He,t+p) reaction
Remco G.T. Zegars 9.0 0.0

E220 Gamow-Teller transitions from ^{48}Ca to intermediate states of double beta decay and
Sven Rakers 2.0 0.0

E221 Neutrino nucleosynthesis of the exotic, heavy doubly odd-mass nuclei ^{138}La and ^{180}Ta
Peter von Neumann-Cosel 0.0 0.0

E223 Measurement of the α-decay from the states around E_x=10.3 MeV in ^{12}C
Masatoshi Itoh 8.0 8.0

E226 Spallation UCN production in 0.5 K He-II
Yasuhiro Masuda 15.0 0.0

E227 Measurement of the reflection and transmission of ultra-cold neutrons by a filter method
Toshio Kitagaki 0.0

E228 Study of spallation He-II source of UCN
Korobkina Ekaterina 10.0 0.0

E229 Measurements of intermediate energy neutron transport through shielding materials
Shingo Taniguchi 6.0 0.0

E230 Measurements of neutron energy spectra from thick target bombarded by high energy protons
Noriaki Nakao 3.0 0.0

R04 (p,pα) Knockout Measurements on Light Nuclei Using 350 MeV Polarized Protons
Akira Okihana 9.0 9.0
1. Alpha spectroscoppic factors for ^{6}Li,^{7}Li,^{9}Be, and ^{1}2C from the (p,pα) raections at 296MeV
T. Yoshimura et al., Nucl. Phys. **A 641** (1998) pp.3-20

R07 ^{90}Zr(α,tp) reaction at 200 MeV
Mamoru Fujiwara 8.0 8.0
1. Structure of the $11/2^{-}$ anaolog state in ^{91}Nb populated by the ^{90}Zr(α,t) reaction
H.K.T. van der Molen et al., Phys. Lett. **B 502** (2001) 1-8.
2. Damping mechanisms of high-lying single-particle states in ^{91}Nb
H.K.T. van der Molen et al, Nucl. Phys. **A** to be published.

R11 Isovector Giant Resonances in ^{58}Ni Studied by the (^{7}Li, ^{7}Be-γ) Reaction
Shintaro Nakayama 6.0 6.0

R12 High Resolution Measurement of the ^{176}Yb(^{3}He,t)^{176}Lu Spectrum and Solar Neutrino Response
Charry Goodman 4.0 4.0
1. Gamow-Teller Strengths of the Inverse-Beta Transition ^{176}Yb→^{176}Lu for Spectroscopy of Proton-Proton and other sub-MeV Solar Neutrinos.
M. Fujiwara et al., Phys. Rev. Lett. **85** (2000) 4442-4445.
2. Master thesis, Satoshi Yamanaka, Osaka University, March 1999
Study of solar neutrino detection rates of ^{176}Yb and ^{160}Gd via the (^{3}He,t) reaction
3. Master thesis, Keigo Hara, Osaka University, March 2000
Study of solar neutrino detection by ^{176}Yb with Charge Exchange Reactions

R13 Measurement of Absolute Values of Differential Cross Sections of (p,2p) Reaction
Tetsuo Noro 3.0 3.0
1. Master thesis, E. Obayashi, Osaka University, March 1999
Study of NN interaction in nuclei by using (p,2p) reactions
Current status: A part of data analysis is still in progress.

R14 フォトン・キャッチャー検出器の中性子検出効率測定
Nnoboru Sasao 2.0 2.0

R15 The ^{165}Ho(^{3}He,t)^{165}Er Reaction Cross Section at Zero-degrees for Calibration of Solar Neutrino Responses of ^{160}Gd and ^{176}Yb
Mamoru Fujiwara 1.5 1.5
1. published with R12
Gamow-Teller Strengths of the Inverse-Beta Transition ^{176}Yb→^{176}Lu for Spectroscopy of Proton-Proton and other sub-MeV Solar Neutrinos.
M. Fujiwara et al., Phys. Rev. Lett. **85** (2000) 4442-4445.

R16 Nuclear chemistry
Naruto Takahashi 1.0 1.0
1. Startup of Transactinide Chemistry in JAERI
H.Haba et al., Radiochim. Acta, **88**, 267-271(2000)
2. Doctor thesis, Mafuja S.Sultana, Osaka University, 1999.
Solvent Extraction Behavior of Astatine and Radioiodine at Tracer Concentration

R19 Measurements of Detection Efficiencies of Space Neutron Detector
Yasushi Muraki 3.0 3.0
1. Master thesis, S. Ohno, Nagoya university, March 2001

R20 Search for Tetraneutron via ^{7}Li(^{7}Li,^{10}C)4n Reaction
Tamio Yamagata 2.0 2.0

R21 Preliminary tests for ^{95m}Tc tracer production
Riki Seki 1.0 1.0

R22 Effects of solar particles on the air at high latitude
Yasushi Muraki 3.0 3.0
Current status: We need further experiment to confirm the result.

R23 Search for Supernarrow Dibaryons via the $p + d$ Reaction
Atsushi Tamii 1.5 1.5
1. Search for narrow dibaryon resonances by the $pd \to pdX$ and $pd \to ppX$ reactions
A. Tamii et al., Phys. Rev. C **65** (2002) 047001

R24 Chemical behaviour of IV-th atom (Zr)
Atsushi Shinohara 0.5 0.5

R25 Study of Direct Transfer Reaction Mechanism of the ^{9}Be(^{14}N,^{12}N)^{11}Be Reaction at Intermediate Energy Region
Tadashi Shimoda 3.0 3.0
Current status: Observed evidence of direct 2n-transfer mechanism. The data are compatible with 2p-transfer reaction ^{9}Be(^{14}N,^{12}B)^{11}C. A proposal to complete the data is in preparation.

R27 Chemical behaviour of IV-th atom (Zr)
Atsushi Shinohara 0.5 0.5
1. Master thesis, Atsushi Toyoshima, Osaka University, 2001.
Ion Exchange Experiments with Rutherfordium
Published together with R36

R28 Search for the low lying single particle 1s state in (p,2p) reaction
Yusuke Yasuda 2.0 2.0

R29 Sample production for low-temperature nuclear orientation experiments
Susumu Ohya 1.0 1.0

R30 Chemical behaviour of IV-th atom (Zr)
Atsushi Shinohara 0.5 0.5
Published together with R36

R31 Study of memory error of ULSI due to neutron bombardments
Yasuki Nagai 1.0 1.0

R32 Preliminary tests for $95m$Tc tracer production
Riki Seki 1.0 1.0
1. Master thesis, Muneharu Kondo, University of Tsukuba, March 2002.
Development of determination method for 99Tc in environmental samples and behavior of 99Tc in the environment

R33 Study of memory error of ULSI due to neutron bombardments II
Yasuki Nagai 6.0 6.0

R34 Effects of solar particles on the air at high latitude
–Developments of a new probe of solar activities in the past
Yasushi Muraki 2.0 2.0

R35 Counter test for the recoil particle spectrometer of the RI beam factory
Harutaka Sakaguchi 0.25 0.25

R36 Tracer experiment for a fundamental study of heavy element chemistry
Atsushi Shinohara 1.0 1.0
1. Master thesis, Yuzuru Shoji, Osaka University, March 2002.
Development of the Rapid Chemical Separation System for the Heavy Actinide Elements
2. Anion Exchnage Behavior of Nobelium
A. Toyoshima et al., J. Radioanal. Nucl. Chem. 255, 485-487 (2003).
3. Anion exchange behavior of Rf in HCl and HNO3 solutions.
H. Haba et al., J. J. Nucl. Radiochem. Sci. 3, 143-146 (2002).
4. Master thesis, Mitsuru Shigekawa, Osaka University, March 2003.
Development of a rapid chemistry for heavy actinides by means of fission products from 252-Cf

R37 Elastic scattering of 420 MeV ^{3}He off ^{16}O.
Jack Rapaport 0.5 0.5

R38 Measurements of absolute cross section of $\vec{p}d$scattering at 250 MeV
Kichiji Hatanaka 1.0 1.0
1. Cross section and complete set of proton spin observables in $\vec{p}d$ elastic scattering at 250 MeV
K. Hatanaka et al., Phys. Rev. C **66** (2002) 044002 (10 pages)

R39 Measurements of differential cross sections for the ^{3}He elastic scattering off
^{12}C, ^{58}Ni and ^{90}Zr at 450 MeV
Junichiro Kamiya 1.0 1.0
1. Doctor thesis, Junichiro Kamiya, Osaka University, March 2003.
Spin dependent ^{3}He-nucleus interaction at 450 MeV
Current status: in preparation for submission with the results of E157 and E182.

R40 Tracer experiment for fundamental studies of heavy atom chemistry
Atsushi Shinohara 0.5 0.5

R41 Range-energy relation in mass-produced Nuclear Emulsion
Kazuma Nakazawa 0.5 0.5

R42 Study on the radiation damage of the Si-PIN diode detector onboard Astro-E2 satellite
Motohide Kokubun 0.5 0.5

R43 Study of memory error of ULSI due to neutron bombardments II
Yasuki Nagai 6.0 6.0

R44 Tracer experiment for fundamental studies of heavy atom chemistry
Atsushi Shinohara 1.0 1.0
1. Master thesis, Mitsuru Shigekawa, Osaka University, March 2003.
Rapid chemical experiment for the heavy actinide elements by using spontaneous fission products

R45 Measurement of fast neutrons from spallation reaction by 392 MeV proton
Tatsushi Shima 0.5 0.5

R46 Study of the decay property of ultra low excited nuclei ^{229m}Th
Atsusi Shinohara 0.5 0.5
Published together with R48.

R47 Request for additional beam time in conjunction with E200
Umesh Garg 3.0 3.0

R48 Study of the decay property of ultra low excited nuclei ^{229m}Th
Atsusi Shinohara 0.5 0.5
1. Alpha-decay from the 3.5eV isomer of 229Th
T. Mitsugashira et al., J. Radioanal. Nucl. Chem. 255, 63-66 (2003).

R49 Production of ^{146}Sm
Akihiko Yokoyama 0.5 0.5