

PROPOSAL FOR EXPERIMENT AT RCNP

25 January 2010

TITLE:

Development of g-factor measurement of high-spin states with recoil catcher method; Measurement of the g-factor of the $61/2^+$ high-spin isomer in ^{151}Er

SPOKESPERSON:

Full Name Tomokazu Suzuki
 Institution Research Center for Nuclear Physics, Osaka University
 Title or Position Research Fellow
 Address Mihogaoka, Ibaraki, Osaka 567-0047
 Phone number +81-6-6879-8939
 FAX number +81-6-6879-8939
 E-mail tomokazu@rcnp.osaka-u.ac.jp

EXPERIMENTAL GROUP:

Full Name	Institution	Title or Position
Minoru Tanigaki	Research Reactor Institute, Kyoto University	Assistant Professor
Mitsuhiro Fukuda	RCNP, Osaka University	Associate Professor
Kichiji Hatanaka	RCNP, Osaka University	Professor
Hooi Jin Ong	RCNP, Osaka University	Assistant Professor
Atsushi Tamii	RCNP, Osaka University	Associate Professor
Atsuko Odahara	Department of Physics, Osaka University	Associate Professor
Yasuyuki Gono	RIKEN	Researcher
Yuji Miyashita	RIKEN	Researcher
Yasuo Wakabayashi	Japan Atomic Energy Agency (JAEA)	Postdoctor

RUNNING TIME: Installation time without beam 7 days(for each beam time)
 Excitation function measurement 2 days
 Test running time for experiment 3 days
 Data runs 7 days

BEAM LINE: AVF-Bypass-EN course
 AVF-H course

BEAM REQUIREMENTS: Type of particle ^{129}Xe
 Beam energy 748 MeV (5.8 MeV/nucleon)
 Beam intensity > 10 pA
 Any other requirements

BUDGET: Experimental expenses 1,280 kyen

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SUMMARY OF THE PROPOSAL

We propose a g-factor measurement of the $61/2^+$ high-spin isomeric states in ^{151}Er with recoil-catcher method. Since this is the first proposal of g-factor measurement of high-spin states in RCNP, developments of the experimental method is required.

The high-spin isomer in ^{151}Er has been observed in the recent E277 experiment at RCNP. The excitation energy and spin were found to be higher than the known high-spin isomers of other $N = 83$ isotones. The present proposed experiment will be able to verify if the structure of the isomer in ^{151}Er is the same as others of the $N = 83$ isotones. High-spin states of ^{151}Er will be populated via the $^{28}\text{Si}(^{129}\text{Xe},6n)^{151}\text{Er}$ reaction with a ^{129}Xe beam, at a beam energy of 5.8 MeV/nucleon. The produced isomer of ^{151}Er will be mass separated by the EN course and transported to a low background area. The emitted γ ray will be detected by HP-Ge detectors, The g-factor will be measured by the stroboscopic method.

The requested beam time is 7 days for data run, plus another 5 days for the development of this experiment.