

## PROPOSAL FOR EXPERIMENT AT RCNP

22 January 2009

**TITLE:****Pigmy E1 and giant M1 resonances in N=50 isotones,  $^{88}\text{Sr}$ ,  $^{90}\text{Zr}$  and  $^{92}\text{Mo}$ .****SPOKESPERSONS:**

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**EXPERIMENTAL GROUP:**

Name	Institution	Title or Position
Y. Fujita	Dep. Phys., Osaka University	Associate Professor
H. Akimune	Dep. Phys., Konan University	Associate Professor
T. Yamagata	Dep. Phys., Konan University	Professor
T. Kondo	Dep. Phys., Konan University	PhD student
C. Iwamoto	Dep. Phys., Konan University	PhD student
A. Okamoto	Dep. Phys., Konan University	PhD student
K. Hatanaka	RCNP, Osaka University	Professor
H. Okamura	RCNP, Osaka University	Professor
M. Yosoi	RCNP, Osaka University	Associate Professor
T. Shima	RCNP, Osaka University	Assistant Professor
H.J. Ong	RCNP, Osaka University	Assistant Professor
J. Zenihiro	RCNP, Osaka University	Doctoral student
T. Suzuki	RCNP, Osaka University	Doctoral student
H. Fujita	RCNP, Osaka University	Researcher
H. Matsubara	RCNP, Osaka University	PhD student
Y. Shimbara	Dep. Phys., Niigata University	Assistant Professor
H. Sakaguchi	Dep. of Applied Physics, Miyazaki Univ.	Professor
T. Shizuma	Japan Atomic Energy Agency	Researcher
T. Kawabata	CNS, Univ. Tokyo	Assistant Professor
Y. Sasamoto	CNS, Univ. Tokyo	PhD student
Y. Sakemi	CYRIC, Tohoku University	Professor
M. Itoh	CYRIC, Tohoku University	Professor
H.P. Yoshida	CYRIC, Tohoku University	Postdoctoral fellow

**THEORETICAL SUPPORT:**

Name	Institution	Title or Position
S. Goriely	AA, Universite Libre de Bruxelles, Belgium	Senior Researcher
H. Sagawa	Aizu University	Professor
H. Nakada	Chiba University	Chiba University

**RUNNING TIME:**

Beam tuning time for experiment 2 days

Data runs 6 days

**BEAM LINE:**

Ring : WS course

**BEAM REQUIREMENTS:**

Type of particle proton

Beam energy 300 MeV

Beam intensity  $\leq 10$  nA

Any other requirements energy resolution  $\leq 20$  keV

halo-free, small emittance

**BUDGET:**

Experimental expenses 1,700,000 yen

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We propose to investigate extra E1 and M1 strengths in N=50 isotones,  $^{88}\text{Sr}$ ,  $^{90}\text{Zr}$  and  $^{92}\text{Mo}$ , in the low-energy tail of GDR by high-resolution inelastic proton scattering at 300 MeV. Emphasis is placed on giant M1 and pigmy E1 resonances previously reported in inelastic proton scattering and nuclear resonance fluorescence experiments, respectively. We measure proton spectra and angular distributions of E1 and M1 strengths at most forward angles including  $0^\circ$ . The present investigation is expected to resolve the bump structure of giant M1 nature to large extent and to clarify E1 and M1 strengths by a thorough theoretical analysis of angular distributions with  $\Delta L=0$  and  $\Delta L=1$  DWBA plus E1 Coulomb excitation calculations.