RCNP EXPERIMENT E295

PROPOSAL FOR EXPERIMENT AT RCNP

10 July 2006

TITLE: Investigation of the Giant Monopole Resonance with ^{6}Li inelastic scattering at forward angles

SPOKESPERSONS:

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EXPERIMENTAL GROUPS:

University of Notre Dame, USA - Research Center for Nuclear Physics, Japan - Kyoto University, Japan - Konan University, Japan - Tohoku University, Japan - KVI, Groningen, The Netherlands - BARC, Mumbai, India - SINP, Kolkata, India.

RUNNING TIME:

Total running time not including beam preparation	6 days [or 4+4 (see text)]

BEAM LINE: Grand Raiden

BEAM REQUIREMENTS:

Type of particle	^{6}Li
Beam energy	300 MeV
Beam intensity	2 nA
Other requirements	beam must be halo-free
	highest stability over the running period is required

BUDGET:

No budget for experiment requested.

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SUMMARY OF THE PROPOSAL

We request beam time to initiate inelastic scattering measurements at forward angles (including 0°) with 50-MeV/A ^{6}Li beams, with the aim of studying the giant monopole resonances (GMR). These measurements are expected to establish the feasibility of performing measurements with a new probe and also might have implications on measurements with radioactive ion beams in the inverse reaction, thereby studying the GMR in nuclei far from the stability line. We will investigate the GMR strength in ^{90}Zr and ^{40}Ca, nuclei that we have already studied with inelastic α scattering. For the first experiment, we will obtain complete elastic scattering data, to extract appropriate optical model potentials, and use the small-angle inelastic scattering data in a multipole decomposition analysis to extract the GMR strength.