RCNP EXPERIMENT E 318

PROPOSAL FOR EXPERIMENT AT RCNP

07 July, 2008

TITLE: Investigation of the Giant Monopole Resonance with inelastic deuteron scattering at extremely forward angles: Towards measuring the nuclear incompressibility with radioactive ion beams.

SPOKESPERSONS:

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EXPERIMENTAL GROUPS:

University of Notre Dame, USA - Research Center for Nuclear Physics, Japan - Konan University, Japan - Tohoku University, Japan - Tokyo Institute of Technology, Japan - CNS, University of Tokyo, Japan - KVI, Groningen, The Netherlands - IPN, Orsay, France.

RUNNING TIME:

Total running time not including beam preparation	8 days

BEAM LINE: Grand Raiden

BEAM REQUIREMENTS:

Type of particle	^{2}H
Beam energy	200 MeV
Beam intensity	As high as feasible.
Other requirements	beam must be halo-free
	highest stability over the running period is required

BUDGET SUMMARY:

Purchase of enriched targets	Y1,000,000

SUMMARY OF THE PROPOSAL

We request beam time to initiate inelastic scattering measurements at forward angles (including 0°) with 100-MeV/A ^{2}H beams, with the aim of studying the giant monopole resonances (GMR). These measurements aim at establishing the feasibility of performing measurements with radioactive ion beams in the inverse reaction and thereby studying the GMR in nuclei far from the stability line. We will investigate the GMR strength in ^{208}Pb, ^{116}Sn, and ^{58}Ni, nuclei that we have already studied with inelastic α scattering. We will also obtain 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.