RCNP EXPERIMENT E275

PROPOSAL FOR EXPERIMENT AT RCNP

January 20, 2005

TITLE:

Inelastic α scattering exciting the superdeformed band in ^{40}Ca and ^{32}S.

SPOKESPERSON:

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EXPERIMENTAL GROUP:

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RUNNING TIME:	Installation time without beam	1.5 days(for each beam time)
	Beam tuning and data runs	4 days
BEAM LINE:		Ring : WS course
BEAM REQUIREMENTS:	Type of particle	alpha
	Beam energy	400MeV for α
	Beam intensity	20 nA
	Any other requirements	energy resolution $\leq$ 150 keV for α and $\leq$ 50 keV for high resolution α halo-free, small emittance
BUDGET:	Experimental expenses	540,000 yen

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Inelastic α scattering exciting the superdeformed band in ^{40}Ca and ^{32}S

SPOKESPERSON: M. Itoh

SUMMARY OF THE PROPOSAL

During the beam time for ISGDR for light nuclei we have found for the first time candidate states of the superdeformed band in ^{32} S, which have been searched during these 20 years by many researchers in the world.
In this proposal, in order to study the transition form factor of the superdeformed band, we propose to measure inelastic α scattering on ^{40}Ca, which is already established by the measurement of the sequential γ decay from high spin state. At the next stage, we plan to measure inelastic α scattering on ^{32}S with the high resolution α beam exciting the same states to obtain the information on widths of these states by using the dispersion matching method. Our new data will also give new information on the origin of the superdeformed band, namely molecular like structures of ^{16}O- ^{16}O states in ^{32}S.