RCNP EXPERIMENT E255

PROPOSAL FOR EXPERIMENT AT RCNP

20 January 2005

TITLE:
Elastic proton scattering to deduce neutron density distributions in oxygen isotopes

SPOKESPERSON:

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EXPERIMENTAL GROUP:

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Y. Watanabe	RIKEN	(Scientist)
T. Ohnishi	RIKEN	(Postdoctal Fellow)
H. Takeda	RIKEN	(Postdoctal Fellow)

RUNNING TIME: Data runs 4 days

BEAM LINE: Ring : WS course

BEAM REQUIREMENTS:

Type of particle	protons
Beam energy	300 MeV
Beam intensity	500 nA
Beam resolution	100keV
stable,small emittance	

BUDGET: Experimental expenses 600,000 yen

Travel expenses for people from RIKEN ,Kyoto University and Kyushu University should be supported by RCNP.

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SUMMARY OF THE PROPOSAL

We are proposing to measure elastic scattering off ^{16,18}O to tune NN interaction, to deduce neutron density distribution. by tunig NN interaction not only medium-heavy nuclei(A$\geq$40) but also light nuclei. The research of nuclear density distributions of more nuclei would be enable. We are going to deduce neutron density distribution of ^{18}O as application. By comparing ^{16}O with ^{18}O, we thick we can see thin neutron skin thickness.

Recently progress in the production of short lived nuclei and the development of radioactive nuclear beams has given this field the necessary tools. Many interested experimental results around light nuclei are reported, the research about light nuclei including unstable nuclei in term of nuclear density distributions is important.