E443

RCNP EXPERIMENT E

PROPOSAL FOR EXPERIMENT AT RCNP

17 July 2014

TITLE:

Understanding the effect of tensor interactions in light nuclei: Studies of proton-neutron and neutron-neutron correlations.

SPOKESPERSON:

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EXPERIMENTAL GROUP:

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G.L. Zhang	School of Phys. and Nucl. Energy Engin., Beihang University	Associate Professor
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J. Tanaka	RCNP, Osaka University, Japan	D3
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A. Inoue	RCNP, Osaka University, Japan	M2
P.Y. Chan	RCNP, Osaka University, Japan	M1
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THEORETICAL SUPPORT:

Full Name	Institution	Title or Position
H. Toki	RCNP, Osaka University	Emeritus Professor
K. Ogata	RCNP, Osaka University	Associate Professor
T. Myo	Osaka Institute of Technology	Associate Professor
D.Y. Pang	School of Phys. and Nucl. Energy Engin., Beihang University	Associate Professor

RUNNING TIME:

Installation time without beam	2 days
Beam tuning and startup for experiment	1 days
Data runs	3.8 days

BEAM LINE: Ring : WS-GRAF course

BEAM REQUIREMENTS:

Type of particle	proton
Beam energy	392 MeV
Beam intensity	$\geq$ 10 nA
Other requirements	energy resolution $\leq$ 300 keV
	timing resolution $\leq$ 150 psec
	halo-free, small emittance

BUDGET: Experimental expenses 800,000 yen

expenses during our stay is expected to be covered by RCNP, travel fee from abroad would be covered by the groups

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SPOKESPERSON: TERASHIMA Satoru, ONG Hooi Jin

SUMMARY OF THE PROPOSAL

Measurements of (p,dp) and (p,dn) reactions at finite deuteron-scattering angles on ^{12}C and ^{16}O targets using proton beam at 392 MeV are proposed as an extended study on the effect of tensor interactions in nuclei. The experiment will be performed at the newly constructed Grand RAiden Forward-mode (GRAF) beam line to achieve low-background coincidence measurements. Measurements will be performed using the Grand Raiden (GR) spectrometer at 5.0, 10.0 and 19.0 degrees. The scattered deuterons will be detected by two vertical drift chambers and three plastic scintillators placed at the focal plane of GR. The coincidence protons or neutrons will be detected by a new backward nucleon detector (BAND).

Based on the data from the previous experiments and realistic yield calculation, we would like to request beam time of 3.8 days for the measurements at the 392 MeV. An additional day is also requested for setting up the detector system, beam tuning and for contingency purpose. The total requested beam time is 4.5 days.