RCNP EXPERIMENT E270

PROPOSAL FOR EXPERIMENT AT RCNP

21 July 2005

TITLE:
Study of three-nucleon force effects via the measurements of A_y and $K_y^{y'}$ for the $p+d$ breakup reaction at 250 MeV.

SPOKESPERSON:

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RUNNING TIME:	Development of device	1 days
	Test running time for experiment	1 days
	Data runs	9 days
BEAM LINE:		Ring : WS course, GR + LAS
BEAM REQUIREMENTS:	Type of particle	polarized p
	Beam energy	250 MeV
	Beam intensity	$\leq$ 500 nA
	Energy resplution	$\leq$ 300 keV
	Beam polarization	$\geq$ 0.7
BUDGET:	Experimental expenses	0 yen
	Travel plans - 13 participants should be supported by RCNP	

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SPOKESPERSON: Yukie Maeda

SUMMARY OF THE PROPOSAL

Three-nucleon force (3NF) effect is one of the hot topics in nuclear physics. ¿From the recent study at RIKEN, it has been found that differential cross sections of the elastic $p+d$ scattering in the intermediate energy region can be well reproduced by incorporating the 3NF in the Faddeev calculation based on modern nucleon-nucleon (NN) interaction. In addition to the highly precise data of cross sections, many kinds of spin observables are measured and compared with rigorous Faddeev calculations with and without the 3NF. From these results, it became clear that the spin dependent part of present 3NF model are not sufficient to reproduce spin observables. Recently, $n+d$ and $p+d$ measurements were carried out at 250 MeV at RCNP. Faddeev calculations with 3NF underestimate the cross section data. It indicates the presence of the missing features of the three nucleon system at this energy region. For the next step of the 3NF study, breakup reactions are considered to play important role because the breakup cross sections become larger at higher energy.
In this proposal, we measure the vector analysing power A_y and the spin transfer coefficient $K_y^{y'(p)}$ for $p+d \to p+n+p$ breakup reaction. These data provide important information on the 3NF effects and make a discrimination between 3NF models.