RCNP EXPERIMENT E284

PROPOSAL FOR EXPERIMENT AT RCNP

26 Jan. 2006

TITLE : Measurement of hole-state distributions for Ca isotopes by using ($\vec{d}$,^{3}He) reaction

(Revised proposal of E258)

SPOKESPERSONS : NORO, Tetsuo Professor
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EXPERIMENTAL GROUP :

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Iwao, Y.	Kyoto U.	M2			
Takeda, H.	Riken	Special Postdoctoral Researcher			

RUNNING TIME : Data runs 6.5 days

BEAM LINE : WS course (Grand Raiden)

BEAM REQUIREMENTS :	Type of particle	Polarized deuteron
	Beam energy	80 MeV
	Beam intensity	100 nA
	Energy resolution	35 keV
BUDGET :	Experimental expenses	1.1M Yen
	Travel expenses	0.8M Yen

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SUMMARY OF THE PROPOSAL

It is proposed to measure differential cross sections and analyzing powers for (d,^{3}He) reactions on calcium isotopes, ^{40,42,44,48}Ca, and to deduce spectroscopic factors for 1d$_{3/2}$- and 1d$_{5/2}$-hole states. The purpose of this measurement is to observe change of the ℓ-s splitting among these isotopes, to which a significant effect from the NN tensor force has been theoretically predicted. In the original E258 proposal, approved in January 2005, it was planed to use $(p, 2p)$ reactions for the same purpose. After a short trial experiment, however, we found that significant development works would be required to take data with good energy resolution required for the present purpose, and concluded that the use of the (d,^{3}He) reaction is a realistic way to obtain the result urgently. On the development works for high-resolution $(p, 2p)$ measurement, we are planning to realize it in a different framework, as a project to be reviewed by the P-PAC.