

PROPOSAL FOR EXPERIMENT AT RCNP

26 Jan. 2006

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

(Revised proposal of E258)

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EXPERIMENTAL GROUP :

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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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SPOKESPERSON : NORO, Tetsuo (Dept. of Phys., Kyushu Univ.)

SUMMARY OF THE PROPOSAL

It is proposed to measure differential cross sections and analyzing powers for ($d, ^3\text{He}$) reactions on calcium isotopes, $^{40,42,44,48}\text{Ca}$, 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 planned 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 ($d, ^3\text{He}$) 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.