

E413

PROPOSAL FOR EXPERIMENT AT RCNP

1 January 2000

TITLE:

Measurement of hole-state distributions in Ca isotopes
by using ($p, 2p$) reactions

SPOKESPERSON:

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EXPERIMENTAL GROUP:

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Wakasa, T.	Dept. of Phys., Kyushu Univ.	(AP)
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Yasuda, J.	Dept. of Phys., Kyushu Univ.	(M1)
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Lee, C.	CNS, Univ. Tokyo	(M2)
Milman, E.	Kyungpook Univ./ RIKEN Nishina Center	(D1/IPA)

RUNNING TIME:	Installation time without beam	1 days(for each beam time)
	Development of device	1 \times 2 day
	Calibration of spectrometers	0.5 \times 2 days
	Data runs	10.5 days
	Total	13.5 days

BEAM LINE:

Ring : WS course

BEAM REQUIREMENTS:

Type of particle	polarized p
Beam energy	200 MeV
Beam intensity	\leq 200 nA
Other requirements	energy resolution \leq 80 keV

BUDGET:

Experimental expenses

0 yen

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SUMMARY OF THE PROPOSAL

We propose to measure differential cross sections and analyzing powers for $(p, 2p)$ reactions on calcium isotopes, $^{40,44,48}\text{Ca}$, and to deduce spectroscopic factors corresponding to $1d_{3/2}$ -, $2s_{1/2}$ - and $1d_{5/2}$ -knocked out states. One of the main purposes of the measurement is to observe possible isotope dependence of the level splittings, especially the ℓ - s splitting between $1d_{3/2}$ and $1d_{5/2}$ orbitals, to which a significant effect from the NN tensor force has been theoretically predicted. Since these states are significantly fragmented, we perform level assignments, both of ℓ and j , for many fragmented states and obtain mean values of the separation energies for these orbits by using s-factors as weighting factors. Integrated cross sections for these orbits are also of interest since reported total s-factors for $1d_{5/2}$ is significantly smaller than those for $1d_{3/2}$. We try to extract s-factors embedded in continuum states.