

Type of particle	p
Beam energy	416 MeV
Beam intensity	≤ 200 nA
Other requirements	energy resolution ≤ 300 keV halo-free, small emittance, vertically defocused

BUDGET:	Experimental expenses (slits)	200 kyen
	travel expenses	300 kyen

TITLE:

Measurement of Triple Differential Cross Section of $pp \rightarrow pp\pi^0$ Reaction and Feasibility Studies of (p, 2p) Reaction for Pionic Atom Spectroscopy

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SUMMARY OF THE PROPOSAL

We propose a three-body reaction (p,2p) so as to populate deeply-bound pionic states. Two ejectile protons will be measured by Grand Raiden and LAS set at 25.5° . Accidental backgrounds will be removed by using the correlation between vertical coordinates of the reaction vertices reconstructed from the focal-plane detectors.

In order to demonstrate this background rejection method, the triple differential cross section of the $pp \rightarrow pp\pi^0$ reaction will be measured. Furthermore, the background level in the Sn(p,2p) reaction near the π emission threshold with and without background rejection will be investigated. We expect a good signal-to-noise ratio ($\approx 1/10$) even before background rejection in the former reaction, while the spectroscopy of deeply-bound pionic atoms with the latter reaction requires the rejection of accidental background due to its huge contribution.