RCNP EXPERIMENT E274

PROPOSAL FOR EXPERIMENT AT RCNP

20 July, 2005

TITLE: ^{3}He+t cluster structure in ^{6}Li

SPOKESPERSON:

Tamio YAMAGATA: Professor
Department of Physics, Konan University, Kobe 658-8501
e-mail: yamagata@center.konan-u.ac.jp
TEL: 078-435-2469, FAX: 078-435-2539

EXPERIMENTAL GROUP:

Hiroaki UTSUNOMIYA	Dept. of Physics, Konan University	Professor
Hidetoshi AKIMUNE	Dept. of Physics, Konan University	Associate Professor
Nobuyuki WARASHINA	Dept. of Physics, Konan University	M2
Shintaro NAKAYAMA	Dept. of Physics, Univ. of Tokushima	Professor
Kenichi FUSHIMI	Dept. of Physics, Univ. of Tokushima	Associate Professor
Rena HAYAMI	Dept. of Physics, Univ. of Tokushima	M2
Mamoru FUJIWARA	RCNP, Osaka University	Associate Professor
Keigo KAWASE	RCNP, Osaka University	D3
Kosuke NAKANISI	RCNP, Osaka University	D3
Hisanobu HASHIMOTO	RCNP, Osaka University	D2
Masaru YOSOI	Dept. of Physics, Kyoto University	Research Associate
Mark B. GREENFIELD	Dept. of Physics, ICU	Professor
Masayoshi TANAKA	Kobe Tokiwa College	Professor
Kenshi SAGARA	Dept. of Physics, Kyushu University	Professor
Takashi KUDO	Dept. of Physics, Kyushu University	D2
Shun ASAJI	Dept. of Physics, Kyushu University	D2

RUNNING TIME:

Total running time not including beam preparation 5 days

BEAM LINE:

WS-course, Grand RAIDEN

BEAM REQUIREMENTS:

Type of particle	^{4}He
Beam energy	300 MeV
Beam intensity	$\sim$ 20 nA
Other requirements	Energy resolution $\sim$ 150 keV
	Beam must be halo-free
	Energy stability over experimental run is required

BUDGET:

Experimental expense 600,000 yen
Travel plans - 12 participants should be supported by RCNP

RCNP EXPERIMENT E274

TITLE: ^{3}He+t cluster structure in ^{6}Li

SPOKESPERSON:
Tamio YAMAGATA

SUMMARY OF THE PROPOSAL

The present work aims at the search for the ^{3}He+t clusters structures in ^{6}Li via the ^{3}He(α,p) reaction at 300 MeV. We expect that the S and D states, and P and F resonances should be observed below and above the threshold energy for ^{3}He+t decay in ^{6}Li, respectively. In the previous RCNP experiments we found the ^{3}P (T=1) resonances of the di-trinucleon-clusters structure in isobaric triplet, ^{6}He, ^{6}Li and ^{6}Be by using the ^{6}Li(^{7}Li,^{7}Be), ^{7}Li(^{3}He,α), and ^{6}Li(^{3}He,t) reactions. In ^{6}Li, the ^{1}P (T=0) resonance has been also observed. Furthermore, possible signals for the F resonances in ^{6}He and ^{6}Li have been detected. In the present experiment we will determine the excitation energies for the ^{3}He+t multiplet via the stripping reaction, and will establish the di-trinucleon cluster structure.