E391

RCNP EXPERIMENT E

PROPOSAL FOR EXPERIMENT AT RCNP

20 January 2012

TITLE:
Title title

SPOKESPERSON:

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Title or Position	Associate Professor
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EXPERIMENTAL GROUP:

Full Name	Institution	Title or Position
Julian Gibeln	Department of Physics, Caen University	(Professor)
Muhsin N. Harakeh	KVI, GSI	(Professor)
Masatoshi Itoh	Cycrotron Radiation Center, Tohoku University	(Assistant Professor)
Takahiro Kawabata	Department of Physics, Kyoto University	(Associate Professor)
Atsushi Tamii	RCNP, Osaka University	(Associate Professor)
Mamoru Fujiwara	RCNP, Osaka University	(Associate Professor)
Martin Freer	Birmingham Centre for Nuclear Education and Research	(Professor)
Chihiro Iwamoto	Department of Physics, Konan University	(D3)
Akiyuki Okamoto	Department of Physics, Konan University	(D3)
Ryota Ishida	Department of Physics, Konan University	(M1)

RUNNING TIME:

Installation time without beam	3 days(for each beam time)
Beam test	2 deays
Beam tuning	1 days
Test running time for experiment	2 days
Data runs	4 days

BEAM LINE: Ring : WS course

BEAM REQUIREMENTS:

Type of particle	^{36}Ar (+11)
Beam energy	50 MeV/A (1.8 GeV)
Beam intensity	$\sim$ 10 pnA
Beam conditions	$\Delta E \leq 200$ keV halo-free, small emittance

BUDGET: Experimental expenses (6,700,000) yen
see section 4

RCNP EXPERIMENT E

TITLE:
Search for alpha condensed states in ^{36}Ar

SPOKESPERSON: Hidetoshi Akimune

SUMMARY OF THE PROPOSAL

We propose an experiment to measure the decay of medium-heavy nuclei to many consists of alpha-particles. The purpose of this experiment is to study the nuclear structure of possible α condensed states with many α particles as building-blocks in excited states in medium-heavy nuclei. Alpha condensed states are theoretically predicted in even-even N=Z nuclei. On the other hand, experimentally, almost no detailed nuclear structure information about such states is obtained except for light nuclei such as ^{8}Be, ^{12}C and ^{16}O. Our aim is to study alpha-condensed state in ^{36}Ar by means of inverse kinematics reactions of alpha inelastic scattering from ^{36}Ar and by detecting the subsequent alpha decay (^{4}He(^{36}Ar, n-α)) at 50 MeV/A .