RCNP EXPERIMENT E

PROPOSAL FOR EXPERIMENT AT RCNP

14 February 2016

TITLE:

^{34g,m}Cl(d,$p\gamma$)^{35}Cl: A Single-particle probe of mirror energy difference trends in high-J states

SPOKESPERSON:

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EXPERIMENTAL GROUP:

...and the CAGRA collaboration

RUNNING TIME:

Installation time without beam	5 days (for each beam time)
Development of device	1 days
Test running time for experiment	1 days
Data runs	7 days

BEAM LINE: Ring : EN course

BEAM REQUIREMENTS:

Type of particle (primary)	^{36}Ar
Beam energy (primary)	468 MeV
Beam intensity (primary)	$\geq$ 40 nA ($\leq$1 nA for test)
Type of particle (secondary)	^{34m}Cl
Beam energy (secondary)	374 MeV
Beam intensity (secondary)	$\geq$ 5x10^4 pps
Other requirements	A test of the isomeric content of the ^{34}Cl beam is required. This can be done with a relatively low-intensity primary beam.

BUDGET: Experimental expenses 0 yen

SAFETY CONTROLLED ITEMS:

- None.

TITLE:
Title title

SPOKESPERSON: Calem R. Hoffman

SUMMARY OF THE PROPOSAL

We propose a measurement of the single-neutron strength in ^{35}Cl for high-spin states up to J=13/2 via the (d,$p\gamma$) reaction on both the ^{34g}Cl J^{π}=0^{+} ($T_{1/2}$=1.6 s) ground state and the ^{34m}Cl J^{π}=3^{+} ($T_{1/2}$=32 m) isomeric state using the CAGRA HPGe clover array and an ancillary Si detector array. The extracted single-neutron overlaps will provide a unique approach to testing the single-particle aspects of the states making-up mirror energy differences (MEDs), and in particular the large changes that occur in MEDs at high-J. Due to the unknown population of the isomer content of the ^{34}Cl beam, one (1) day is requested to first determine this value through an implantation and decay measurement. If the ^{34m}Cl beam is found to be 5x10^{4} pps or higher, the (d,$p\gamma$) measurement is possible. Based on this lower limit, a total of seven (7) days is requested to carry out the ^{34g,m}Cl(d,$p\gamma$) reaction and extract single-neutron strengths in ^{35}C up to J=13/2.