E376

RCNP EXPERIMENT E

PROPOSAL FOR EXPERIMENT AT RCNP

July 11, 2011

TITLE:
Radiative Strength Functions in ^{74}Ge and ^{96}Mo: A Test of the Axel-Brink Hypothesis

SPOKESPERSONS:

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EXPERIMENTAL GROUP:

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THEORETICAL SUPPORT:

Name	Institution	Title or Position
V.Yu. Ponomarev	IKP, Technische Universität Darmstadt, Germany	Senior Researcher
J. Wambach	IKP, Technische Universität Darmstadt, Germany	Professor

RUNNING TIME:

Installation time without beam	2 days
Beam tuning time for experiment	2 days
Data runs	13.5 days

BEAM LINE: Ring : WS course

BEAM REQUIREMENTS:

Type of particle	p
Beam energy	300 MeV
Beam intensity	$\leq$ 2-8 nA
Any other requirements	energy resolution $\leq$ 20 keV halo-free, small emittance

BUDGET:

Experimental expenses	500,000 yen

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SUMMARY OF THE PROPOSAL

Polarized proton scattering at 300 MeV at 0° has been experimentally established as a tool to extract the properties of low-energy electric and magnetic dipole modes in heavy nuclei. A decomposition of the (p, p') cross sections according to their electric or magnetic character can be achieved in two independent ways by either measuring angular distributions including 0° or by using a polarized beam and measuring polarization transfer observables to distinguish spinflip and non-spinflip contributions. Good correspondence of these two methods is achieved as demonstrated recently in a case study of ^{208}Pb. We propose measurements of the spin-transfer coefficients D_{LL} and D_{NN} at 0° and of the cross section angular distributions in two selected nuclei, ^{74}Ge and ^{96}Mo, in order to deduce the the dipole strength distributions and thus the radiative strength function (RSF). The latter nucleus is amongst the best studied with a variety of experimental techniques but shows large discrepancies between the different results, while the former has been selected for a case study by the main groups working in this field. A comparison of RSFs determined from different experiments deduced either from photoexcitation or decay will allow a test of the Axel-Brink hypothesis underlying the analysis of Compound decay experiments and e.g. employed to correct photonuclear reaction cross sections for thermal excitations in stellar environments.