E360

RCNP EXPERIMENT E

PROPOSAL FOR EXPERIMENT AT RCNP

12 June 2010

TITLE:
Production of polarized ^{58}Cu for the development of transient field technique

SPOKESPERSON:

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EXPERIMENTAL GROUP:

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Takuji Izumikawa	Radioisotope Center, Niigata University	(AP)
Takashi Ohtsubo	Department of Physics, Niigata University	(AP)
Takashi Nagatomo	International Christian University	(RA)
Tadanori Minamisono	Fukui University of Technology	(P)

RUNNING TIME:

Installation time without beam	7 days(for each beam time)
Beam tuning	1 days
Data runs	5 days
Total	6 days

BEAM LINE: Ring : EN course

BEAM REQUIREMENTS:

Type of particle	^{58}Ni
Beam energy	$60A$ MeV
Beam intensity	$\geq$ 100 pnA
Any other requirements	nothing special

BUDGET:

Travel expenses	500,000 yen
β-NMR chamber	500,000 yen
Total	1000,000 yen

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SUMMARY OF THE PROPOSAL

We propose an experiment to produce a spin polarized unstable nucleus ^{58}Cu by means of the transient field method. Polarized unstable nuclei are extremely useful for studying the nuclear electromagnetic moments. While a method to produce intense radioactive nuclear beams (RNB) has been developed in recent years, a polarization technique that is universally available for any elemental species of the RNB has been strongly desired in order to extend the study of the nuclear moments of far unstable and heavier nuclei in *sd*- and pf-shell region.

The transient field method is expected to be one of the most promising methods to generate spin polarization of unstable nuclei principally independent of elemental species. As a first step, we therefore try to develop the transient field method by using a short-lived nucleus ^{58}Cu for which recently the first β-NMR signal was successfully detected.