RCNP EXPERIMENT E230

PROPOSAL FOR EXPERIMENT AT RCNP

22 July 2003

TITLE:

Measurements of neutron energy spectra from thick target bombarded by high energy protons

SPOKESPERSON:

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EXPERIMENTAL GROUP:

Full Name	Institution	Title or Position
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Shingo TANIGUCHI	Japan Synchrotron Radiation Res. Inst.(JASRI)	(Researcher)
Takashi NAKAMURA	Cyclotron RI Center (CYRIC), Tohoku Univ.	(Professor Emeritus)
Koji OISHI	Institute of Technology, Shimizu Corporation	(Senior Research Engineer)
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Yoshitomo UWAMINO	Institute of Physical and Chemical Res.(RIKEN)	(Manager, Safety Center)
Mamoru BABA	Cyclotron RI Center (CYRIC), Tohoku Univ.	(P)
Kichiji HATANAKA	RCNP, Osaka Univ.	(P)
Takane SAITO	RCNP, Osaka Univ.	(AP)
Atsushi TAMII	RCNP, Osaka Univ.	(AP)

RUNNING TIME:	Installation time without beam	1 days (for each beam time)
	Development of device	1.5 days
	Data runs	6 days
BEAM LINE:		Ring : N0 course
BEAM REQUIREMENTS:	Type of particle	p
	Beam energy	150, 250, 400 MeV
	Beam intensity	$\leq$ 10 nA
	Any other requirements	halo-free, small emittance, 1/9 beam pulsing
BUDGET:	Traveling expenses	600,000 yen

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TITLE:
Measurements of neutron energy spectra from thick target bombarded by high energy protons

SPOKESPERSON: Noriaki NAKAO

SUMMARY OF THE PROPOSAL

The energy and angular distributions of neutrons produced from thick targets (thick target yields, TTY) will be measured using various kinds of materials and proton energies. The neutron energy spectra will be measured by using the time-of-flight (TOF) method, and production angles in a few forward directions will be selected by moving the target in the beam swinger magnet. Detector efficiencies will be also measured by using the p-^{7}Li quasi-monoenergetic neutrons to obtain the accurate neutron energy spectra. These data are useful to estimate the neutron generation by the beam loss at the beam line materials in the proton accelerator facilities for radiation protection and shielding purposes. It will take 2.5 days to measure the TTY for 4 targets and 3 angles and detector efficiency. Total requirement of the beam time is 7.5 days for 3 proton energies.