RCNP EXPERIMENT E269

PROPOSAL FOR EXPERIMENT AT RCNP

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TITLE:

Measurements of Intermediate Energy Neutron Transport through the Low Activation Concrete and Tissue Equivalent Material

SPOKESPERSON:

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EXPERIMENTAL GROUP:

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RUNNING TIME:	Installation time without beam	1 days(for each beam time)
	Data runs	2 days $\times$ 3 times = 6 days
BEAM LINE:		Ring : N0 course
BEAM REQUIREMENTS:	Type of particle	p
	Beam energy	150, 250, 350 MeV
	Beam intensity	$\leq$ 200 nA
	Any other requirements	
BUDGET:	Traveling expenses	600,000 yen

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SPOKESPERSON: Shingo TANIGUCHI

SUMMARY OF THE PROPOSAL

This proposal has a plan to measure the intermediate energy neutron transport in low activation concrete which has been recently used in high intensity accelerator facility and tissue equivalent material with quasi-monoenergetic neutron sources produced by p-Li reactions using 150, 250 and 350 MeV protons. This proposal is the further extension of the presently proceeding experiment of neutron transport through ordinary concrete and iron shields(E229).

In order to estimate shielding characteristics of the low activation concrete, neutron spectra just behind the low activation concrete shield will be measured with an NE213 scintillator and a multi-moderator detector by using an unfolding method coupled with the response matrix. The neutron attenuation data obtained in this concrete is essentially important to investigate the shielding ability, compared with that of the ordinary concrete. Neutron dose distribution measurements in a tissue equivalent material will be measured with a Tissue Equivalent Proportional Counter(TEPC), which is also very important to validate the dose evaluation methods for human body used for the shielding design of high-energy radiation fields such as accelerator facilities. Both measurements will be good benchmark data of neutron transport through matter for investigating the accuracy of various simulation calculation codes.

It will take 2 days for each proton energy to obtain a complete data set of neutron spectra behind the various thicknesses of the concrete shield and tissue equivalent material. The total requirement of the beam time is 6 days for three proton energies.