PROPOSAL FOR EXPERIMENT AT RCNP

12 July 2007

TITLE:
Measurement of elastic neutron-scattering cross sections on carbon, silicon, and lead in intermediate energy region

SPOKESPERSON:

Full Name	Daiki SATOH
Institution	Nuclear Science and Engineering Directorate, Japan Atomic Energy Agency
Title or Position	Researcher
Address	Tokai-mura, Naka-gun, Ibaraki 319-1195, Japan
Phone number	+81-29-282-5242
FAX number	+81-29-282-6768
E-mail	satoh.daiki@jaea.go.jp

EXPERIMENTAL GROUP:

Full Name	Institution	Title or Position
Daiki SATOH	Japan Atomic Energy Agency	(Researcher)
Yosuke IWAMOTO	Japan Atomic Energy Agency	(Researcher)
Tatsuhiko SATO	Japan Atomic Energy Agency	(Researcher)
Akira ENDO	Japan Atomic Energy Agency	(Senior Researcher)
Yukio SAKAMOTO	Japan Atomic Energy Agency	(Senior Researcher)
Masayuki HAGIWARA	High Energy Accelerator Research Organization	(Assistant Professor)
Hiroshi IWASE	High Energy Accelerator Research Organization	(Assistant Professor)
Yoichi KIRIHARA	Sokendai	(Graduate Student)
Hiroshi YASHIMA	Research Reactor Institute, Kyoto Univ.	(Assistant Professor)
Takashi NAKAMURA	Cyclotron and Radioisotope Center, Tohoku Univ.	(Professor Emeritus)
Atsushi TAMII	Research Center for Nuclear Physics, Osaka Univ.	(AP)
Kichiji HATANAKA	Research Center for Nuclear Physics, Osaka Univ.	(P)

RUNNING TIME:

Installation time without beam	1 day(for each beam time)
Test running time for experiment	0.5 day
Data runs	3.5 days

BEAM LINE: Ring : N0 course

BEAM REQUIREMENTS:

Type of particle	p
Beam energy	150, 250, 350 MeV
Beam intensity	$\leq$ 700 nA
Any other requirements	halo-free, small emittance, beam pulsing

BUDGET: Traveling expenses 500,000 yen

TITLE:
Measurement of elastic neutron-scattering cross sections on carbon, silicon, and lead in intermediate energy region

SPOKESPERSON: Daiki SATOH

SUMMARY OF THE PROPOSAL

Angular differential elastic neutron-scattering cross sections will be measured for carbon, silicon, and lead samples in 150, 250, and 350 MeV neutron incidences. The quasi-monoenergetic neutron beams are produced via $^7Li(p,n)$ reaction. The elastic scattering neutrons are counted by liquid organic scintillators located at corresponding angles with time of flight technique. The absolute cross sections are determined by measuring incident neutron flux with the detectors used for the scattering neutrons.
The obtained data will be dedicated to sophistication of a particle transport analysis with nuclear data. The accurate particle transport analysis leads to establishment of reasonable radiation-protection system in high-energy accelerator facilities. Furthermore, the data for elastic neutron scattering provide a useful knowledge for some areas in basic nuclear physics.
Total requirement of the beam time is 4 days for three proton energies, including a test running to check the experimental procedure.