E405

RCNP EXPERIMENT E

PROPOSAL FOR EXPERIMENT AT RCNP

18 July 2012

TITLE:

^{12}C elastic scattering on ^{12}C at the 100A MeV for studying the origin of repulsive forces.

SPOKESPERSON:

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EXPERIMENTAL GROUP:

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T. Ito	RCNP, Osaka University	D1
H. Sakaguchi	RCNP, Osaka University	Guest Scientist

RUNNING TIME:	Installation time without beam	2 days
	beam development and tuning for experiment	1 day
	Data runs	1 day
BEAM LINE:		Ring : WS course
BEAM REQUIREMENTS:	Type of particle	^{12}C
	Beam energy	100A MeV
	Beam intensity	0.1-1.0 pnA
	Any other requirements	
		energy resolution $\leq$ 700 keV
		halo-free, small emittance
BUDGET:	Experimental expenses	250,000 yen
	expenses during our stay is requested to be covered by RCNP, travel fee from abroad would be covered by the groups	

TITLE:
^{12}C elastic scattering on ^{12}C at the 100 MeV/A for the study of repulsive force origin.

SPOKESPERSON: ZHANG Gaolong/TERASHIMA Satoru/TANIHATA Isao

SUMMARY OF THE PROPOSAL

Recently theoretical development of optical potential suggests a method to study the repulsive nature due to the three body forces. Thus it is important to explore the repulsive nature of nucleus-nucleus interaction experimentally. The repulsive nature of the interaction can be observed as a change of diffraction pattern of the elastic scattering. We proposed this experiment 100A MeV ^{12}C-^{12}C reaction to measure the angular distribution of elastic and inelastic scattering by using the magnetic spectrometer "Grand Raiden" at RCNP, Osaka University. The high energy resolution of magnetic spectrometer provides the valuable information for distinguishing the projectile excitation from target excitation. This data together with the data at higher energy (at IMP/Lanzhou) will provide a clear evidence of the effect of three-body forces in nucleus-nucleus collisions.