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PROPOSAL FOR EXPERIMENT AT RCNP

18 July 2012

TITLE: $\beta^+\beta^+$ -type heavy-ion double charge exchange study on neutron-rich nuclei**SPOKESPERSON:**

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EXPERIMENTAL GROUP:

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Masaki Sasano	RIKEN Nishina Center	R
Juzo Zenihiro	RIKEN Nishina Center	PD
Masanori Dozono	RIKEN Nishina Center	P
Susumu Shimoura	Center for Nuclear Study, University of Tokyo	AP
Kentaro Yako	Center for Nuclear Study, University of Tokyo	A
Shinsuke Ota	Center for Nuclear Study, University of Tokyo	A
Shinichiro Michimasa	Center for Nuclear Study, University of Tokyo	D3
Hiroshi Tokieda	Center for Nuclear Study, University of Tokyo	D3
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Takashi Hashimoto	RCNP, Osaka University	PD
Kenjiro Miki	RCNP, Osaka University	AP
Takahiro Kawabata	Department of Physics, Kyoto University	A
Satoshi Sakaguchi	Department of Physics, Kyushu University	A
Yukie Maeda	Department of Applied Physics, University of Miyazaki	A

RUNNING TIME: Installation time without beam 3 days
Beam tuning time 3.0 days
Data runs time 9.5 days

BEAM LINE: Ring : WS course

BEAM REQUIREMENTS: Type of particle ^{18}O
Beam energy 60 MeV/nucleon
Beam intensity ≥ 40 pnA
Any other requirements energy spread ≤ 200 keV

BUDGET: Experimental expenses 600,000 yen
Traveling and living expenses 0,000 yen

TITLE: $\beta^+\beta^+$ -type heavy-ion double charge exchange study on neutron-rich nuclei**SPOKESPERSON:** Hiroaki Matsubara and Motonobu Takaki**SUMMARY OF THE PROPOSAL**

It is proposed to measure cross sections for the heavy-ion charge exchange (HIDCX) ($^{18}\text{O}, ^{18}\text{Ne}$) reaction at 60 MeV/nucleon on ^{12}C and ^{13}C target nuclei for the purpose of establishing this reaction as a new spectroscopic tool for neutron-rich nuclei. Measured cross sections for the reaction on ^{12}C target will be used for determining the energy dependence of the HIDCX cross sections in conjunction with those previously measured at 80 MeV/nucleon. The high resolution Grand Raiden spectrometer will be used for minimizing the signal-to-noise ratio in the spectrum, by applying dispersion matching condition between the spectrometer and the beam line. Measurement on ^{13}C will give us the first successful application of the HIDCX reaction for studying nuclear structures of unbound final nuclei, i.e. ^{13}Be in this case.