RCNP EXPERIMENT E220

PROPOSAL FOR EXPERIMENT AT RCNP

22-July-2003

TITLE:

Gamow-Teller Transitions from ^{48}Ca to Intermediate States of Double Beta Decay and to the IAS of Fragmented $M1$ States

SPOKESPERSON(s):

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EXPERIMENTAL GROUP:

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RUNNING TIME:

^{48}Ca data taking runs	2.0 days
Mesurements for the background isotopes (like ^{40}Ca, ^{42}Ca, O, C)	0.5 days
Usually after a run of ≈ 3 days, the cyclotron and the beam line should be retuned. For the retuning	0.5 days

BEAM LINE: Ring : WS course, high resolution mode

BEAM REQUIREMENTS:

Type of particle	^{3}He
Beam energy	420 MeV
Beam intensity	$10 \sim 20$ nA
Energy resolution	$\Delta E \leq 100$ keV, small emittance

BUDGET: Support to the PhD students and Postdocs from Münster for their stay of about half a month.

SCHEDULE: We request the beam time late fall or winter, 2003. We have a wish to run the experiment together with the Ni isotope measurements of the Gent group to spare the time for beam tuning and dispersion matching.

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SPOKESPERSONS: Sven Rakers and Yoshitaka Fujita

1 Summary of Experiment

- **Summary of proposal and experiment:**

The objective is to measure GT$^-$ high-resolution strength distributions in the nucleus ^{48}Sc by means of the (^{3}He, t) reaction. In the (^{3}He, t) reaction at $E = 140$ MeV/nucleon, the proportionality has been established for the transitions with $B(\mathrm{GT}) \geq 0.04$ form the comparison with the GT strengths from the isospin analogous β decays [1, 2].

References

[1] Y. Fujita et al., Phys. Rev. C **59**, 90 (1999).

[2] Y. Fujita et al., Phys. Rev. C **67**, 064312 (2003).