

PROPOSAL FOR EXPERIMENT AT RCNP

20 January 2005

TITLE:

Further development of the high-resolution ($^3\text{He,t}$) probe and the application to detailed studies of nuclear structure and the ($^3\text{He,t}$) reaction mechanism

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SUMMARY OF THE PROPOSAL

In recent years, the capability to perform detailed studies using the ($^3\text{He,t}$) reaction has significantly improved at RCNP: high resolution experiments using dispersion-matching techniques have been developed and, in achromatic mode, development of raytracing has resulted in extraction of accurate angular differential cross sections. We will perform an experiment with the goal to combine these two capabilities and use that to perform a detailed study of the ($^3\text{He,t}$) reaction mechanism at 140 MeV/nucleon on a variety of nuclei (^{26}Mg , ^{58}Ni) that are important for the understanding of nuclear structure, astrophysical applications and serve as benchmarks for ($t,^3\text{He}$) experiments performed at similar beam energies (115-125 MeV/nucleon) at the National Superconduction Cyclotron Laboratory at Michigan State university.