

Abstract Submitted  
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**ORISS: A compact isomer and isobar separator for study of exotic decays** A. PIECHACZEK, V. SHCHEPUNOV, H.K. CARTER, J.C. BATCHELDER, UNIRIB, ORAU, Oak Ridge, TN 37830, E.F. ZGANJAR, Louisiana State University, Baton Rouge, LA 70803 — A compact isobar and isomer spectrometer and separator ORISS (Oak Ridge Isomer Separator and Spectrometer), based on the multi-pass-time-of-flight principle, is being constructed. A mass resolving power of 110,000 (fwhm) and a transmission of 50% have been achieved as a spectrometer with an off-line ion source with large emittance. As a separator, molecules of N<sub>2</sub> and CO with a mass difference of 1/2500 or 10.433 MeV were separated with ToF peaks corresponding to a mass resolution of 40,000. For injection of radioactive ions into ORISS and to further improve its mass resolution, we have constructed cooler/buncher RF quadrupoles and demonstrated a bunch width of 9 ns (fwhm) and a transmission of 75 – 80 %. With this bunch width, ORISS can achieve a mass resolution of  $\sim 400,000$  and will be able to separate nuclei or isomers with a mass difference of 1/200,000, corresponding to 470 keV at mass A=100. At present, the quadrupoles are being integrated into the ORISS system. ORISS will be used for decay spectroscopy to provide isotopically pure samples of exotic species around <sup>100</sup>Sn and of neutron rich nuclei. In addition, ORISS will allow a fast and efficient search for isomers within an entire isobaric chain.

A. Piechaczek  
UNIRIB, ORAU, Oak Ridge, TN 37830

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