Abstract Submitted
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New detector array - the HRIBF Modular Total Absorption Spectrometer[1] MARZENA WOLINSKA-CICHOCKA, ORNL, ORAU, KRZYSZTOF RYKACZEWSKI, ORNL, MAREK KARNY, ORNL, ORAU, UW, ALEKSANDRA KUZNIAK, UTK, UW, ROBERT GRZYWACZ, UTK, ORNL, CHARLIE RASCO, LSU, DAVID MILLER, UTK, CARL J. GROSS, JIM JOHNSON, ORNL — The construction of a new Modular Total Absorption Spectrometer (MTAS) at the Holifield Radioactive Ion Beam Facility (HRIBF) at Oak Ridge National Laboratory will be presented. The total absorption gamma spectra measured with MTAS will be used to derive a true beta-feeding pattern and resulting beta strength function for fission products. In particular, the measurements of decay heat released by radioactive nuclei produced in nuclear fuels at power reactors will be performed. MTAS is made up of 19 large NaI(Tl) crystals each encapsulated with a 0.8-mm-thick carbon fiber. There are also two 1-mm- thick Silicon Strip Detectors surrounding a moving tape collector that count beta-energy loss signals. The structure is shielded by more than 1-inch of lead around MTAS which reduces background radiation significantly. MTAS efficiency for full energy deposition of gamma ray approaches nearly 90% for 300 keV gammas and over 75% for a 5 MeV gamma transition.

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