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An Update on the Retarding Potential Grid System for a Neutral Particle Analyzer EPHREM D. MEZONLIN, JAMES B. TITUS, Florida A&M University, JAY K. ANDERSON, JOSH A. REUSCH, University of Wisconsin - Madison — The ion energy distribution in a magnetically confined plasma can be inferred from the neutral particles that escape the plasma. On the Madison Symmetric Torus (MST), deuterium neutrals are measured in the energy range 0.34 to 45 keV by the Florida A&M University compact neutral particle analyzer (CNPA) and the MST advanced neutral particle analyzer (ANPA). The CNPA energy range covers the bulk ions from the thermal to the beginning of the fast-ion tail (0.34 to 5.2 keV) with high energy resolution (25 channels) while the ANPA covers the vast majority of the fast-ion tail distribution (up to 45 keV) with low energy resolution (10 channels). MST has gained a wealth of information about the fast-ion distribution, but much more information could be gleaned from a higher energy resolution analyzer over the fast-ion tail. Retarding potential analyzers have been used on spacecraft for decades to measure ion distributions in extraterrestrial atmospheres by slowing down charged particles before they reach the detectors. Recent work has been done to design and implement a retarding potential between the vacuum chamber of MST and the CNPA to be able to use the CNPA's high energy resolution over any 5 keV range between 0 and 35 keV. An update of the construction and implementation of the retarding potential grid system will be presented.

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