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Design and construction of an MR-TOF-MS for the CHIP-TRAP Penning trap mass spectrometer at Central Michigan University[1] PHILIP SNOAD, RAMESH BHANDARI, NADEESHA GAMAGE, MADHAWA HORANA GAMAGE, MATTHEW REDSHAW, Central Michigan University — High precision mass measurements are vitally important in a wide range of fields, such as nuclear structure, nuclear astrophysics, neutrino physics, metrology, and tests of fundamental physics. At Central Michigan University we are developing a Penning trap mass spectrometer (CHIP-TRAP) for high-precision mass measurements with stable and long-lived isotopes e.g. for a measurement of the ^{163}Ho EC Q-value to aid direct neutrino mass determination experiments, and the ^{36}Cl neutron separation energy that, in combination with precise γ-ray spectroscopy measurements will enable a test of $E = mc^2$. To aid in the efficient preparation and transport of ions from radioactive and low abundance isotopes, we are designing a multi-reflection time-of-flight mass-separator (MR-TOF-MS) to increase the path length of ions as they travel from our ion sources to the Penning trap. In this presentation, I will show results from simulations of ion transport through our MR-TOF-MS that indicate our design goal of a resolving power R > 20,000 is achievable. I will describe the design of the MR-TOF-MS and report on the status of the fabrication, assembly, and commissioning of the apparatus.

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