PAC07 Abstract

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Abstract We describe a high resolution (a few x 10-4) 90-degree cylindrical electrostatic energy analyzer for 1-MeV (singly ionized) heavy ions for experiments in the Heavy Ion Fusion Science Virtual National Laboratory. By adding a stripping cell, the energy reach of the analyzer is extended to 2 MeV. This analyzer has high dispersion in a first-order focus with bipolar deflection-plate voltages in the range of +-50 kV. We will present 2- and 3-D calculations of vacuum-field beam trajectories, space-charge effects, field errors, and a multipole corrector. The corrector consists of 12 rods arranged in a circle around the beam. Such a corrector has excellent properties as an electrostatic quadrupole, sextupole, or linear combination. The improved energy diagnostic allows measurements of beam charge state and energy spread, such as caused by charge exchange or temperature anisotropy, and better understanding of experimental results in longitudinal beam studies.

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Footnote

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