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Magnet Design of the Electron Cooling System for HIAF

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The electron cooling technology is applied in the spectrometer ring (SRing) for HIAF to boost the luminosity of high-density beam. There are 4 kinds of main coils are used to offer longitudinal field along electron path. In this paper, the three-dimensional magnets of the electron cooler are analyzed. The model consists of a gun section, two 90° angle toroids with a radius of 1 m, a cooling section with a length of 8 m and a collector section. The electron is transporting from the gun through the cooling section to the collector. For the model, the magnetic field along electron path and ion path is simulated and ion trajectory is displayed to offer data for correcting the orbit.

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