Abstract Submitted
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An improved trochoidal electron gun design[1] WILLIAM TERRY, CHRISTOPHER BRYAN, LUIS RIOS, LEIGH HARGREAVES, California State University Fullerton — Electron scattering experiments, for example, elastic scattering, conducted in strong magnetic fields have the potential to allow consideration of targets that are impractical in purely electrostatic experiments. A prominent example is electron scattering from biomaterials, such as uracil, data for which would allow improved simulation of electron transport in biological plasma environments. The Trochoidal Electron Monochromator (TEM) is a well-established gun design that allows for production monochromatic electron beams in magnetic fields. However, the standard design suffers from strong coupling of the energy resolution to the beam energy and typically operates in weak (<50 Gauss) magnetic fields, limiting use cases to very low energies (<5eV). We have designed and fabricated a modified TEM, extending the work of [1], that shows good resolution (<100mev) at energies up to 50eV, in magnetic fields up to 500 Gauss, allowing for a much broader range of scattering experiments. We present both simulations of our TEM and performance data. [1] V. Grill, H. Drexel, W. Sailer, M. Lezius and T.D. Mark, Int. J. Mass. Spectrom., **205**, 209 (2001)

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