Charged Particle Motion in the Vicinity of a Magnetic Null Curve[1] RYAN LANE, CARLOS ORDONEZ, University of North Texas — A magnetic null curve is a 1D region of 3D space where the magnetic field is zero and is otherwise non-zero. Two geometries that produce null curves have been studied with classical trajectory Monte Carlo simulations to understand the properties of charged particle motion near the null curve. One system consists of two infinite, straight, parallel wires carrying identical current. In another system the null curve is generated by coaxial coils carrying identical current and separated axially by a small distance. The null curve is directly between the wires or coils, respectively. The motion of charged particles near the null curve and the conditions that produce charged particle confinement are discussed. Possible applications of systems containing magnetic null curves are given and specific experimental challenges are outlined.

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