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Fractal boundaries in chaotic scattering of charged particles from a magnetic neutral line field RICHARD MARTIN, DANIEL HOLLAND, JAMIE SVETICH, Illinois State Univ — In this talk we examine chaotic scattering of charged particles in magnetotail-like fields in the Earth's magnetosphere. We focus on a two-dimensional magnetic neutral line field and compare results with the better studied magnetic field reversal current sheet field. Both of these Hamiltonian systems exhibit chaotic scattering over a wide range of parameter values. In the current sheet there is a well defined energy resonance that governs the dynamics, and we show that the neutral line model has no such resonance. We investigate the fractal behavior of the final state exit region boundaries when particles are injected far from the neutral line or field reversal region. Both models have fractal exit region boundaries, and we compare their behavior.

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