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Sean Gasiorek* (sgasiore@ucsc.edu). *Billiards Inside, Circles Outside: Dynamics of a Charged Particle in a Piecewise Constant Magnetic Field.*

Consider a magnetic field orthogonal to the Euclidean plane which is zero inside a fixed convex domain while having constant strength B outside. The dynamics of a charged particle starting in the domain can be viewed as a perturbation of usual billiard dynamics, the perturbation parameter being $\sim 1/B$. If the boundary is sufficiently smooth and B is greater than the maximum of the curvature of the boundary we show that the resulting map is a twist map, with all the consequences regarding periodic orbits, etc. ensuing. (Received September 20, 2018)