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The Periodic and Quasiperiodic Orbits of a Fractal Billiard.

Rational Billiards is the study of how a point-mass traverses the interior of a regular polygon with interior angles which are rational multiples of π. Until now, investigation of the geodesics of a billiard has not been performed in a domain with a fractal boundary. With any fractal, it is only possible to simulate the nth level approximation of the given set and, with the Koch Snowflake, differentiability along the boundary causes a problem that can be justifiably ignored in Rational Billiards. To such end, we have simulated the trajectory of a point mass as bounded by the Koch Snowflake, showing that the periodic orbits corresponding to integer multiples of $\pi/6$ are periodic and suggesting those associated with suitable rational approximations of $\pi/6$ are quasiperiodic. (Received March 06, 2006)