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Carl P Dettmann* (carl.dettmann@bristol.ac.uk). *Degrees of stickiness in mushroom billiards.*

Billiards are dynamical systems in which a point particle moves uniformly in a specified region except for mirror-like reflections from the boundary. Dynamical properties depend on the geometry, and provide a large variety of illustrative examples of Hamiltonian dynamics, as well as inspiration for physical experiments. Mushroom billiards were introduced by Bunimovich in 2001 as an example of sharply divided (regular and chaotic) phase space. Later, Altmann et al pointed out that almost all mushrooms have parabolic orbits in the chaotic region leading to “stickiness,” algebraic slowing of the chaotic expansion and mixing properties. A zero measure set of mushroom parameters for which these orbits are absent, and the remaining stickiness, originating from the boundary of the chaotic region itself, will be characterised using Diophantine approximation methods. The results may shed light on stickiness in general Hamiltonian systems with mixed phase space. (Received September 15, 2014)