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Renato Feres* (feres@math.wustl.edu), Department of Mathematics, Washington University, Campus Box 1146, St. Louis, MO 63130, and **Hong-Kun Zhang**. *Billiards, Markov chains, and classical scattering*.

We consider Markov chains with continuous state space derived from billiard dynamical systems. The transition probabilities operator for these chains represents a classical scattering operator associated to a surface with “billiard microstructure.” The main results concern the connection between the spectrum of the scattering operator and the shape of the microstructure, as well as a central limit theorem. These results are interpreted in terms of random flights of billiard particles in channels and their diffusion limit. (Received September 07, 2010)