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Perturbations of dispersing billiards via spectral methods.

We will discuss perturbations of the billiard map associated with a periodic Lorentz gas via the stability of the spectrum of the associated transfer operator. Recently, we constructed Banach spaces on which the transfer operator for the unperturbed billiard enjoys a spectral gap. We will present a number of perturbations which fit into this functional analytic framework and for which the spectral gap persists, including: movements and deformations of scatterers, external forces with thermostating, twists or kicks at reflections, and random perturbations composed of these various classes. This approach recovers many known results for these systems and establishes several new ones. (Received December 01, 2012)