

UNICAMP – IMECC
Departamento de Matemática

Seminário de Sistemas Dinâmicos e Estocásticos

Expositor: O. Makarenkov (Imperial College)

Título: Grazing trajectories in dispersing billiards

Data: Sexta-feira, 8 de abril de 2011, 13h30min

Local: Sala 321 do IMECC

Resumo. This talk is devoted to the proof of the following conjecture settled by Rom-Kedar and Turaev: for any dispersing billiard one can find an arbitrary C^r -small perturbation that leads to a billiard with a grazing periodic trajectory (being a trajectory that touches the boundary of the billiard tangentially at least once). The fact that the billiard is dispersing implies that the periodic trajectories are dense in the phase space, but the fact that at least one of them is grazing is not given. The importance of grazing trajectories has been demonstrated in the earlier paper by Turaev and Rom-Kedar [Elliptic islands appearing in near-ergodic flows, *Nonlinearity* **11** (1998), no. 3, 575-600], where the authors proved that a suitable perturbation of a grazing trajectory can produce an asymptotically stable periodic orbit and can, therefore, kill ergodicity of the billiard. This result gives us an indication towards rethinking the bounds of applicability of the Boltzmann conjecture about ergodicity of the gas of hard balls.

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