

Mês de: JUNHO 2014

SEMINÁRIO DE ANÁLISE E EQUAÇÕES DIFERENCIAIS

Dia 5 de Junho (quinta-feira), às 13:30h, na Sala B3-01

Invisibility and retro-reflection in billiards

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Abstract:

We consider the problem of invisibility for bodies with mirror surface within the scope of geometrical optics. The problem amounts to studying billiards in the exterior of bounded regions. Examples of bodies invisible in 1, 2, and 3 directions and bodies invisible from 1 and 2 points are provided in the talk. It is proved that bodies invisible in *all* directions do not exist. The question of maximum number of directions and/or points of invisibility of a body remains open. The duality between invisibility (unperturbed billiard trajectories outside a bounded domain) and periodic billiard trajectories inside the domain is also discussed.

Further, we consider retro-reflecting bodies with mirror surface. A body is called a *perfect retroreflector*, if the direction of any beam of light incident on it is changed to the opposite. We provide several examples of asymptotically retro-reflecting sequences of bodies. It is not known if there exists a perfect billiard retroreflector.

Apoio:



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