Billiard Trajectories inside Cones

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The report discusses billiard trajectories inside an n-dimensional cone over a strictly convex closed manifold M. It is shown that if M is a C^3-smooth manifold, then every trajectory has a finite number of reflections and, in this case, the billiard admits first integrals whose values uniquely determine all billiard trajectories. At the same time, there exists a C^2-smooth manifold M and a billiard trajectory in the cone such that this trajectory has infinitely many reflections in finite time.

References

[1] Mironov A. E., Yin S., *Birkhoff Billiards inside Cones*, arXiv:2501.12843 (2025).

[2] Mironov A. E., Yin S., *Billiard trajectories inside Cones*, *Regul. Chaot. Dyn.*, 2025, vol. 30, no. 4, pp. 688–710.