Geodesic flows on the 2-sphere of Finsler metrics with positive flag curvature

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Abstract:
Let F be a Finsler metric on the 2-sphere with reversibility equal to r. Assume the flag curvatures K of F satisfy (r/(r+1))^2 < K <= 1. Then closed geodesics with certain topological properties (like, for instance, having exactly one transverse self-intersection point) cannot exist. This pinching condition on the flag curvatures turns out to be sharp. The proof uses methods from symplectic topology (pseudo-holomorphic curves on symplectizations of contact manifolds) which, to some extent, may substitute comparison theorems in geometry. This is a joint work with U. Hryniewicz (UFRJ).