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*$C^2$ -densely the 2-sphere has an elliptic closed geodesic*

We prove that a Riemannian metric on the 2-sphere or the projective plane can be  $C^2$ -approximated by one whose geodesic flow has an elliptic closed geodesic. This result was conjectured by M. Herman and also partially recovers in the generic case a claim by H. Poincaré for convex surfaces. Consequences of this theorem are that there is a dense set of metrics in the 2-sphere whose geodesic flow is not ergodic and that there are no structurally stable geodesic flows on the 2-sphere. I find this a beautiful example of the use of modern dynamical systems in Riemannian geometry.