



Instability of planetary flows based on Riemannian geometry

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According to Arnold (1966) ideal two-dimensional hydrodynamics can be formulated as geodesics in the configuration space with a kinetic energy metric. Instability can be assessed by the Jacobi equation, which describes the dynamics of infinitesimal variations along the geodesics, and assuming a negative sectional curvature of the Riemann manifold. Arnold suggested instability of the atmospheric flow based on a double periodic plane (torus), while Dowker and Mo-zheng (1990) and Apps (2008) argue that the spherical geometry stabilizes the flow. The aim of the present work is to determine the stability properties of a variety of spherical background flows.