

**Gomez, Rodrigo P.**

**An integrable flow on a family of Hilbert Grassmannians.** (English) Zbl 0883.58027  
New York J. Math. 2, 69-85 (1996).

Summary: Various researchers have studied examples of infinite-dimensional dynamical systems. In most of the cases, the phase space consisted of a Hilbert or Banach space or a Fréchet space of functions. In this article we propose to study a dynamical system, namely the geodesic flow, over more structurally complex manifolds, the tangent bundles of a family of Hilbert Grassmannians. Using the high degree of symmetry of the spaces and the methods of Thimm and Ii and Watanabe we prove that the geodesic flow is integrable. In the process we determine a spectral invariant à la Moser which completely describes the behavior of the geodesics of the Hilbert Grassmannians. As a result we demonstrate the difference in complexity between the various ranked Hilbert Grassmannians.

**MSC:**

- [37D40](#) Dynamical systems of geometric origin and hyperbolicity (geodesic and horocycle flows, etc.)
- [53D25](#) Geodesic flows in symplectic geometry and contact geometry
- [37J35](#) Completely integrable finite-dimensional Hamiltonian systems, integration methods, integrability tests
- [37K10](#) Completely integrable infinite-dimensional Hamiltonian and Lagrangian systems, integration methods, integrability tests, integrable hierarchies (KdV, KP, Toda, etc.)
- [53C22](#) Geodesics in global differential geometry

**Keywords:**

[symplectic geometry](#); [integrable geodesic flow](#); [tangent bundles](#); [Hilbert Grassmannians](#)

**Full Text:** [EMIS](#) [EuDML](#)