

ABSTRACT. 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 Frechet 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 [9] and Ii and Watanabe [3] we prove that the geodesic flow is integrable. In the process we determine a spectral invariant á la Moser [5] 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.