

Regular F -manifolds: initial conditions and Frobenius metrics

LIANA DAVID AND CLAUS HERTLING

Abstract. A regular F -manifold is an F -manifold (with Euler field) (M, \circ, e, E) , such that the endomorphism $\mathcal{U}(X) := E \circ X$ of TM is regular at any $p \in M$. We prove that the germ $((M, p), \circ, e, E)$ is uniquely determined (up to isomorphism) by the conjugacy class of $\mathcal{U}_p : T_p M \rightarrow T_p M$. We obtain that any regular F -manifold admits a preferred system of local coordinates and we find conditions, in these coordinates, for a metric to be Frobenius. We study the Lie algebra of infinitesimal symmetries of regular F -manifolds. We show that any regular F -manifold is locally isomorphic to the parameter space of a Malgrange universal connection. We prove an initial condition theorem for Frobenius metrics on regular F -manifolds.

Mathematics Subject Classification (2010): 32B10 (primary); 32G99, 53Z05, 53D45 (secondary).