Global solvability of real analytic involutive systems on compact manifolds

Abstract
The focus of this work is the smooth global solvability of a linear partial differential operator associated to a real analytic closed non-exact 1-form b-defined on a real analytic closed n-manifold-that may be naturally regarded as the first operator of the complex induced by a locally integrable structure of tube type and co-rank one. We define an appropriate covering projection such that the pullback of b has a primitive and prove that the operator is globally solvable if and only if the superlevel and sublevel sets of are connected. As a byproduct we obtain a new geometric characterization for the global hypoellipticity of the operator. When M is orientable we prove a connection between the global solvability of and that of which is the last non-trivial operator of the complex, in particular, we prove that is globally solvable if and only if is globally solvable. In the smooth category, we are able to provide analogous geometric characterizations of the global solvability and the global hypoellipticity when b is a Morse 1-form, i.e., when the structure is of Mizohata type. (AU)