Holomorphic de-Rham cohomology of
strongly pseudoconvex CR manifolds with S^1 actions

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Abstract

In this talk, we shall present some joint work with Stephen Yau in our attempt to relate the CR structure to invariants of the singularities that it spans. We shall discuss in particular the holomorphic De-Rham cohomology of a CR manifold and the punctured local holomorphic De-Rham cohomology of an isolated singularity of a complex variety. For a compact strongly pseudoconvex CR manifold X with a transversal holomorphic S^1 action, the two cohomologies have a simple relation, which enables us to compute some easy cases. In case X is three dimensional in C^3, we get a complete characterization of when the holomorphic De-Rham cohomology of X vanish.