

Deformations and rigidity of Levi flat hypersurfaces in compact complex manifolds

Abstract.

A smooth real hypersurface in a complex manifold is Levi flat if admits a foliation by complex hypersurfaces. The existence and properties of Levi flat hypersurfaces in compact complex manifolds are very important in the geometric theory of foliations and were intensively studied last years.

We give firstly a deformation theory for integrable distributions of codimension 1 by defining a differential graduated Lie algebra and a Maurer-Cartan equation associated to the foliation. We find than a natural parametrization adapted for deformations of smooth Levi flat hypersurfaces in a compact complex manifold and study cases of rigidity, ie when the moduli space of deformations has no non-trivial curves through the origin.

As an application, we prove the non-existence of transversally parallelisable Levi flat hypersurfaces in the complex projective plane.

An intrinsic theory of deformations of abstract Levi flat structures is also given.

This is a joint work in collaboration with Paolo de Bartolomeis.