

Cohomological tool to study the singularities of complex foliations.

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In this lecture, I will introduce some cohomological techniques to study the singularities of complex foliations. Most of the results I will state will concern complex foliations in dimension 2. The primary goal is to illustrate how these techniques which are highly non constructive could solve «concrete» problems. The final goal is to give a proof as complete as possible of a recent result due to Emmanuel Paul and myself that gives an explicit description of the moduli space for quasi-homogeneous foliations that admit a first integral. This work is based upon a result of J.-F. Mattei that will also be established. Finally, we will mention some questions that are still open. Below, a basic plan of my lecture is given.

- Unfolding of germs of singular foliations. Equisingularity.
- Introduction to the Čech cohomology for sheaves of groups.
- Kodaira-Spencer map for infinitesimal unfolding. Dimension of the moduli space of unfolding of foliations.
- Moduli space of quasi-homogeneous foliations.