

# Nilpotent singularities of holomorphic foliations. New results on two problems

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Nilpotent singularities of germs of holomorphic foliations in  $\mathbb{C}^2$  have been studied by different authors since the 1980s. One of the main problems has been the analytic classification of these foliations through their projective holonomy group. Almost all cases are studied, except one: when a Poincaré-Dulac type singularity appears. In a joint work with Percy Fernández (PUCP, Lima, Perú), this case is also studied, and a new rigidity formal-analytic result is obtained.

A second problem concerns foliations on the projective plane, with only one singularity of maximal Milnor number. Following some results from Claudia R. Alcántara (Guanajuato University, México), a family of foliations satisfying previous property has, as only singular point, a nilpotent one, of the generalized saddle-node type. In a work in progress with Claudia R. Alcántara, using index theorems, we can prove that the formal separatrix of these foliations is, in fact, convergent. This is an application of global techniques to solve local problems.

In this talk I will try to give an overview of these two results.

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