Section 08: Ordinary Differential Equations and Dynamical Systems | Poster number 27

Rigidity theorem for degenerated singular points of germs of holomorphic vector fields in the complex plane

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ABSTRACT

We consider the class ν_n of germs of holomorphic vector fields in $(C^2, 0)$ with vanishing (n-1)-jet at zero. We prove, that the formal equivalence of two generic germs in $\nu_n, n \geq 2$, implies their analytic (non orbital) equivalence. For $n = 1$ it is known, from the classical theorems (Poincare, Siegel) of analytic (non orbital) classification of holomorphic vector fields, that, in the generic situation, the formal classification is quite simple and coincides with the analytic one. For $n \geq 2$, even the formal classification becomes highly non trivial: functional moduli of formal classification arises. Surprisingly, in this very complicated situation the analytic classification of generic germs coincides with the formal one.

Keywords: *Degenerated singularity, formal equivalence, analytic equivalence, blow-up, t-monodromy, normalyzed time, lifted vector field.*

Mathematics Subject Classification: *32S65, 34A40*

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