

On the characteristic variety of analytic differential systems

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The characteristic variety of linear differential systems has, among others, two important properties: 1. Independence of the filtration. 2. Integrability (sometimes called "involutiveness", e.g. stability of its defining ideal by Poisson bracket). I try to examine how these properties extend to the non linear analytic case. To extend the first one, one has first to define the "D-varieties" (which are the \mathbb{C} -analytic analogues of Ritt's differential algebras) and their morphisms. Then, two characteristic varieties occur naturally; one is related with the theorem of Cauchy-Kovalevski. The other one, which is smaller, but coincide generically with the first one, is related to the linearized system. The extension of property 1, is now the following: both, at least outside of the zero section, are invariant by D-isomorphisms (e.g. the Lie-Bäcklund isomorphisms). One proves also that a D-variety is generically an involutive differential system in the sense of E. Cartan. then, the property 2, extends at the points of involutiveness; at the other points the question is open.