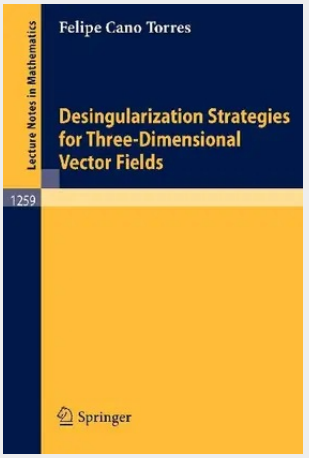
Cano Torres

Desingularization Strategies of Three-Dimensional Vector Fields

For a vector field #3, where Ai are series in X, the algebraic multiplicity measures the singularity at the origin. In this research monograph several strategies are given to make the algebraic multiplicity of a three-dimensional vector field decrease, by means of permissible blowing-ups of the ambient space, i.e. transformations of the type xi=x'ix1, 2is, xi=x'i, i>s. A logarithmic point of view is taken, marking the exceptional divisor of each blowing-up and by considering only the vector fields which are tangent to this divisor, instead of the whole tangent sheaf. The first part of the book is devoted to the logarithmic background and to the permissible blowing-ups. The main part corresponds to the control of the algorithms for the desingularization strategies by means of numerical invariants inspired by Hironaka's characteristic polygon. Only basic knowledge of local algebra and algebraic geometry is assumed of the reader. The pathologies we find in the reduction of vector fields are analogous to pathologies in the problem of reduction of singularities in characteristic p. Hence the book is potentially interesting both in the context of resolution of singularities and in that of vector fields and dynamical systems.

Resolution statements for a vector field.- A partial winning strategy.- Standard transitions from type I.- A winning strategy for type one.- Types two and three.



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