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On the Chern classes of singular varieties

The Chern classes of complex manifolds are important invariants that appear in many fields of geometry and topology. From the topological viewpoint, these are closely related to the local index of Poincaré–Hopf for vector fields, and generalizations of it to the case of sections of certain fibre bundles associated to the tangent bundle. It is natural to ask whether one has similar notions for complex analytic varieties. This is a question that goes back to the work of M. H. Schwartz in the 1960s, MacPherson in the 1970s, and many others after that. In this talk I will speak about work done mostly with Jean-Paul Brasselet and Tatsuo Suwa. We relate this problem with that of studying indices of vector fields on singular varieties, and the various generalizations one has for singular varieties of the concept of tangent bundle.