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Essential singularities of complex analytic vector fields on $\mathbb{C}$

Let X be a complex analytic vector field on $(\mathbb{C}, 0)$. The real trajectories of it are geodesics of a suitable singular flat metric. Analogously to the classical Picard's Theorem, in the vicinity of an isolated essential singularity, the local complexity of X must be studied using certain "global" flow box maps. We describe the geometry encoded is the simplest cases, for these kind of singularities.

Joint work with A. Alvarez–Parrilla.