

Analytic normal form for parabolic line diffeomorphisms

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Abstract: We address the inverse problem for holomorphic germs of a mapping of the complex line near a fixed point which is tangent to the identity. We provide a preferred parabolic map Δ realizing a given Birkhoff–Écalle–Voronin modulus ψ and prove its uniqueness in the functional class we introduce. The germ is the time-1 map of a Gevrey formal vector field admitting meromorphic sums on a pair of infinite sectors covering the Riemann sphere. For that reason, the analytic continuation of Δ is a multivalued map admitting finitely many branch points with finite monodromy. In particular Δ is holomorphic and injective on an open slit sphere containing 0 (the initial fixed point) and ∞ , where is situated the companion parabolic point under the involution $\frac{-1}{\text{id}}$. One finds that the Birkhoff–Écalle–Voronin modulus of the parabolic germ at ∞ is the inverse $\psi^{\circ-1}$ of that at 0.

(This talked is the continuation of the talk on normal forms for resonant saddle points of planar vector fields.)