Deformations of singularities of traceless 2×2 linear differential systems

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One of the simplest, but far from trivial, cases of bifurcations in analytic dynamical systems is that of confluence singularities of 2×2 linear differential systems (or meromorphic connections on rank 2 vector bundles over Riemann surfaces).

In the first part of the talk I'll give an overview of some aspects of formal and local analytic classification of such singularities, focusing on the general/degenerate situation, and on the role played by meromorphic quadratic differentials. I'll also briefly mention an application to the description of the universal deformation parameter of isomonodromic deformations.

In the second part, I'll talk about how the picture extends also to confluences of singularities and of eigenvalues in parametric families. In particular, this includes the degeneration of the linear isomonodromic systems associated to the Painleve equations – one of the main motivations behind the study.