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Title: Irregular connections, Stokes geometry, and WKB analysis

Abstract: We study, using the extended isomonodromy deformation, the WKB approximation of Stokes matrices of a class of meromorphic linear ODE systems on the projective line of Poincaré rank 1. This class of ODE systems appears in various contexts of geometry. We show that, via the degenerate Riemann-Hilbert map, the WKB approximation of Stokes matrices recovers the Gelfand-Tsetlin integrable systems whose action variables match with periods on spectral curves. Based on principles in multi-scale analysis, the degenerate Riemann-Hilbert map will enable us to understand the WKB analysis of Stokes matrices of regular Riemann-Hilbert maps via the isomonodromy flow. If time permits, we will also discuss how spectral networks will help us understand the geometry of WKB analysis of small perturbations of the degenerate Riemann-Hilbert map and give rise to applications in Poisson geometry, representation theory and cluster algebras.