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Parametric Stokes phenomena of Gauss hypergeometric differential equation with a large parameter

Abstract: We consider the hypergeometric differential equation with a large parameter from the viewpoint of the exact WKB analysis. One of main objects in the exact WKB analysis is the notion of WKB solutions which are formal solutions of the equations coming from solutions of the associated Riccati equation. Firstly explicit forms of the Voros coefficients and the Borel sums of them are given for the hypergeometric differential equation with a large parameter. The Voros coefficients are formal series in the negative powers of the large parameter which describes the discrepancy between two WKB solutions with different normalization of integration and they play a role in the analysis of Stokes phenomena with respect to parameters in the equation, which we call parametric Stokes phenomena. Secondly we give some formulas describing parametric Stokes phenomena of WKB solutions.

This work is a collaboration with T. Aoki.