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*Tau-functions on spaces of abelian differentials and determinants of Laplacians in flat metrics with conical singularities over Riemann surfaces*

We define a natural analog of the Jimbo–Miwa tau-function on different strata of the space of holomorphic differentials over Riemann surfaces. We compute the tau-functions in terms of higher genus generalization of Dedekind eta-function. The developed formalism is applied to rigorously compute the determinants of Laplace operators over Riemann surfaces in flat metrics with conical singularities. The holomorphic factorization formula for such determinants gives the higher genus generalization of genus one expression by Ray–Singer.

This is a joint work with Alexey Kokotov.