

# Analytic Langlands correspondence for complex curves

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The Langlands correspondence for complex curves has been traditionally formulated in terms of sheaves rather than functions. Together with Pavel Etingof and David Kazhdan (arXiv:1908.09677, arXiv:2103.01509), we have formulated an analytic (or function-theoretic) version as a spectral problem for an algebra of commuting operators acting on half-densities on the moduli space  $\text{Bun}_G$  of  $G$ -bundles over a complex algebraic curve. This algebra is generated by the global differential operators on  $\text{Bun}_G$  (holomorphic and anti-holomorphic quantum Hitchin Hamiltonians) as well as integral operators, which are analytic analogues of the Hecke operators of the classical Langlands correspondence. We conjecture that the joint spectrum of this algebra (properly understood) can be identified with the set of opers for the Langlands dual group of  $G$  whose monodromy is in the split real form (up to conjugation). Furthermore, we give an explicit formula relating the eigenvalues of the Hecke operators and the global differential operators.

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