Asymptotics of Green functions: Riemann surfaces and Graphs

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Analysis on graphs and Riemann surfaces admits many interesting parallels. Both settings admit a canonical measure (the Arakelov–Bergman and Zhang measures) and an associated canonical Green function reflecting crucial geometric information.

Motivated by the question of describing the limit of the Green function on degenerating families of Riemann surfaces, we introduce new higher rank versions of metric graphs and their Laplace operators. We discuss how these limit objects describe the asymptotic of the Green function on metric graphs and Riemann surfaces close to the boundary of their respective moduli spaces.

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