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Part IV

A Farey Tail for Attractor Black Holes

This part of the thesis is based on the result reported in publication [108]. Other publications in the same period on closely related topics are [109, 110, 30]. An important follow-up publication which refines our results is [111].

The goal of the present part of the thesis is to gain a better understanding of the microstates of D4-D2-D0 black holes in IIA string theory compactified on a Calabi-Yau manifold. These microstates are counted by a (generalized) elliptic genus of a (0,4) conformal field theory. By exploiting a spectral flow that relates states with different charges, and using a generalised Rademacher formula, we find that the elliptic genus has an exact asymptotic expansion in terms of semi-classical saddle-points of the dual supergravity theory. This generalizes the known "Black Hole Farey Tail" of [112] to the case of $\mathcal{N} = 2$, $d = 4$ black holes in string theory.

