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Revisiting α′ corrections to heterotic two-charge black holes

We find solutions of the heterotic string effective action describing the first-order alpha prime corrections to two-charge black holes at finite temperature. Making explicit use of these solutions, we compute the corrections to the thermodynamic quantities: temperature, chemical potentials, mass, charges and entropy. We check that the first law of black hole mechanics is satisfied and that the thermodynamics agrees with the one extracted from the Euclidean on-shell action. We show that our results are in agreement with the corrections for the thermodynamics recently predicted by Chen, Maldacena and Witten. Finally, we comment on the thermodynamics and the solution in the extremal limit, focusing on the possibility of generating an horizon with alpha' corrections.

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