

Adventures in 5d Higher-derivative Supergravity

Friday 19 January 2024 12:00 (30 minutes)

Higher-derivative corrections in the AdS/CFT correspondence allow us to capture finer details of the dual CFT and to explore the holographic dictionary beyond the infinite N and coupling limits. Following an EFT approach, I will discuss extremal AdS black hole solutions in five dimensional supergravity with higher-derivative corrections. I will first provide a general analysis of near-horizon geometries of rotating extremal black holes and I will show how to obtain the charges and chemical potentials from them. I will discuss the near-horizon solutions of the two-derivative theory, which we write using a novel parametrization, and next I will show how to compute the higher-derivative corrections of those solutions. The charges and thermodynamic properties of the black hole will then be discussed, along with the ambiguities in the definition of some of these quantities. The charges and potentials turn out to satisfy a “near-horizon version” of the first law of thermodynamics whose interpretation I will make clear. In the supersymmetric case, the results will be shown to match the field theory prediction as well as previous results obtained from the on-shell action.

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