

Probing holography in p -adic CFT

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We holographically calculate the partition functions of CFTs dual to Bruhat-Tits trees and p -adic BTZ black holes. Along the way, we propose new spectral decompositions of the Laplacian operator other than the plane-wave basis on these two types of backgrounds, with both analytical and numerical evidence. We extract the density of states and hence entropy from BTZ partition function via inverse Laplace transform. Then the one-loop Witten diagram is computed in the p -adic BTZ black hole background, yielding constraints on the heavy-heavy-light averaged three-point coefficient of its boundary p -adic CFT. Finally, for general p -adic CFTs (not necessarily holographic), we analyze the representation theory of their global conformal group $PGL(2, \mathbb{Q}_p)$, and discuss the suitability of different representations as Hilbert spaces of p -adic CFT.