Summary: We construct a particular flow in the space of 2D Euclidean QFTs on a torus, which we argue is dual to a class of solutions in 3D Euclidean gravity with conformal boundary conditions. This new flow comes from a Legendre transform of the kernel which implements the $\overline{T}$ deformation, and is motivated by the need for boundary conditions in Euclidean gravity to be elliptic, i.e. that they have well-defined propagators for metric fluctuations. We demonstrate equivalence between our flow equation and variants of the Wheeler de-Witt equation for a torus universe in the so-called Constant Mean Curvature (CMC) slicing. We derive a kernel for the flow, and we compute the corresponding ground state energy in the low-temperature limit. Once deformation parameters are fixed, the existence of the ground state is independent of the initial data, provided the seed theory is a CFT. The high-temperature density of states has Cardy-like behavior, rather than the Hagedorn growth characteristic of $TT$-deformed theories.

MSC:
81T10 Model quantum field theories
81T28 Thermal quantum field theory
83C45 Quantization of the gravitational field
53Z05 Applications of differential geometry to physics

Keywords:
AdS-CFT correspondence; models of quantum gravity; conformal field theory; field theories in lower dimensions

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