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Department of Theoretical Physics

THE QUANTUM SPACETIME SEMINAR SERIES

On Branes and Trace Relations

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Date: March 20, 2025

Time: 11 AM IST

Venue: AG80

Zoom link shall be shared separately

We propose and study a holographic relation between the states of giant graviton branes in anti-de Sitter space and trace relations in the dual gauge theory. In a computation of the partition function of half-BPS states in AdS5 x S5, we find that the maximal giant is an unstable saddle point and that its Lefschetz thimble corresponds to the quantization of an imaginary phase space. The states resulting from the quantization of this phase space contribute negatively to the partition function. The state space treatment of trace relations in N=4 SYM suggests that these D-brane states can be regarded as bulk duals of trace relations. We suggest that the Lefschetz trace formula, which computes bulk observables as an alternating sum of the expectation values in an ensemble of states built on each classical open string vacuum, may be a useful way to formulate the holographic map at finite N.

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