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The CFT Dual of a Tidal Force

mardi 8 juin 2021 14:00 (1 heure)

It was demonstrated that a string probe falling radially within a superstrata geometry would experience tidal forces. These tidal forces were shown to excite the string by converting its kinetic energy into motion along the transverse directions. Using the AdS/CFT correspondence we seek to understand this behavior from the perspective of the dual D1D5 CFT. To study this process we turn on an interaction of the theory which is described by a deformation operator. This deformation includes a twist operator which joins and separates 'effective' strings of the D1D5 system. We start with an initial state which is dual to the probe moving within the superstrata geometry. We then use two deformation operators to compute transition amplitudes between this state and a final state that corresponds to excitations along the transverse directions. We show that for long timescales this amplitude grows as t^2 with t being the amount of time for which the deformation operators are turned on. We argue that this process in the CFT is suggestive of the tidal effects experienced by the probe propagating within the dual superstrata geometry.

https://youtu.be/DIM5oz3AWHc

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