

Rotating strings and particles in AdS: Holography at weak gauge coupling and without conformal symmetry

Wednesday, 8 December 2021 14:40 (20 minutes)

We consider gauge/gravity correspondence between maximally supersymmetric Yang-Mills theory in $(p+1)$ dimensions and superstring theory on the near-horizon limit of the D_p -brane solution. The string-frame metric is $AdS_{p+1} \times S^{8-p}$ times a Weyl factor, and there is no conformal symmetry except for $p=3$. We consider states which have angular momenta in the AdS directions. We first show that Gubser, Klebanov and Polyakov's solution, in which a folded string is rotating near the center of AdS, can be recast into a form which connects two points on the boundary. Transition amplitudes of such strings can be interpreted as gauge theory correlators, whether or not there is conformal symmetry. Then, we consider the case of zero gauge coupling, assuming the string worldsheet consists of discrete bits. We reproduce the free-field correlators from string theory, extending the previous result obtained for a special operator. (Based on 2109.12091 [hep-th])

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Session Classification: Short talk