

Heavy-Heavy-Light Three-Point Functions from D-branes Revisited

Friday, 26 November 2021 17:00 (30 minutes)

We study correlation functions of D-branes and a supergravity mode in AdS, which are dual to structure constants of two sub-determinant operators with large charge and a BPS single-trace operator. Our approach is inspired by the large charge expansion of CFT and resolves puzzles and confusions in the literature on the holographic computation of correlation functions of heavy operators. In particular, we point out two important effects which are often missed in the literature; the first one is an average over classical configurations of the heavy state, which physically amounts to projecting the state to an eigenstate of quantum numbers. The second one is the contribution from wave functions of the heavy state. To demonstrate the power of the method, we first analyze the three-point functions in N=4 super Yang-Mills and reproduce the results in field theory from holography, including the cases for which the previous holographic computation gives incorrect answers. We then apply it to ABJM theory and make solid predictions at strong coupling. Finally we comment on possible applications to states dual to black holes and fuzzballs. This talk is based on work done with Peihe Yang, Yunfeng Jiang and Shota Komatsu.

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