

Interacting Vertex Operators in Euclidean AdS_2 : Connected Correlators, Holographic Renormalization and Anomalous Dimensions

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ABSTRACT: We construct interacting correlation functions of normal-ordered vertex operators in Euclidean Poincaré AdS_2 . Starting from the Gaussian scalar theory, we derive connected generating functionals, compute first- and second-order corrections induced by a sine-Gordon type bulk interaction, and extract the renormalized anomalous dimension. We perform holographic renormalization explicitly and analyze scheme dependence. Despite the appearance of logarithmic terms, we show that the resulting boundary theory exhibits ordinary anomalous scaling rather than logarithmic CFT structure.

KEYWORDS: AdS-CFT Correspondence, Conformal Field Theory, Renormalization Group