

## Detailed ultraviolet asymptotics for AdS scalar field perturbations

We present a range of methods used for accurate evaluation of the leading asymptotics for integrals of products of Jacobi polynomials in limits when the degrees of some or all polynomials inside the integral become large. The structures in question have recently emerged in the context of effective descriptions of small amplitude perturbations in anti-de Sitter (AdS) spacetime. The limit of high degree polynomials corresponds in this situation to effective interactions involving extreme short-wavelength modes, whose dynamics is crucial for the turbulent instabilities that determine the ultimate fate of small AdS perturbations. We explicitly apply the relevant asymptotic techniques to the case of a self-interacting probe scalar field in AdS and extract a detailed form of the leading large degree behavior, including closed form analytic expressions for the numerical coefficients appearing in the asymptotics.

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