

The geometry of optimal functionals

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Abstract

In this paper, we give a geometric interpretation of optimal functionals in the context of intersection of symmetry planes and cyclic polytopes. For 1D CFTs, we demonstrate that at given derivative order, the functional is given by a degenerate simplex of the cyclic polytope. More precisely the derivative functionals at $2N+1$ -th order, is given by an unique N -dimensional simplex enclosing the origin. Taking the continuous limit, in the large Δ approximation this qualitatively agrees with that derived by Mazac et al. Remarkably similar construction applies to 2D CFT in the diagonal limit as well as the spin-less modular bootstrap. Finally we show that such geometric interpretation can be extended to functionals associated with bounds beyond the leading operator.