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Non-planar integrated correlator in $\mathcal{N} = 4$ SYM

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Integrated correlator of four superconformal stress-tensor primaries in $SU(N)$ $\mathcal{N} = 4$ super Yang-Mills (SYM) theory in the perturbative limit takes a remarkably simple form, where the L -loop coefficient is given by a rational multiple of $\zeta(2L + 1)$. In this talk, we extend the previous analysis of expressing the perturbative integrated correlator as a linear combination of periods of f -graphs, graphical representations for loop integrands, to the non-planar sector at four loops. At this loop order, multiple zeta values make their first appearance when evaluating periods of non-planar f -graphs, but cancel non-trivially in the weighted sum. The remaining single zeta value, along with the rational number prefactor, makes a perfect agreement with the prediction from supersymmetric localisation.

Link to publication (if applicable)

<https://arxiv.org/abs/2404.18900>

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