

Integrated correlators beyond localisation

Wednesday, May 22, 2024 1:30 PM (1 hour)

I will review 4-pt half BPS correlators in planar $N=4$ super Yang-Mills theory (SYM), dual to graviton scattering in $AdS_5 \times S^5$ via AdS/CFT. In particular I will review the generating functions describing them for all charges at both weak and strong coupling. Integrating certain four-point correlators over their space-time dependence yields quantities that can be computed exactly by supersymmetric localisation, whereas correlators with more general charges are not accessible from this method. Nevertheless we propose an exact expression of such integrated correlators, valid for arbitrary 't Hooft coupling. The expression matches with the known exact localisation-based results for specific charges, as well as with all existing perturbative and strong-coupling results in the literature for more general charges. As an application, our result is used to determine certain 7-loop Feynman integral periods and fix previously unknown coefficients in the correlators at strong coupling.

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