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Exact structure constants of determinant operators

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In this talk, based on [1906.07733] with Y. Jiang and S. Komatsu, we derive the first non-perturbative result for the structure constants of two determinant operators and a non-BPS single-trace operator of finite length in planar $\mathcal{N} = 4$ SYM. First, we introduce a new method based on large-N collective fields, which efficiently computes correlators of such non-single-trace operators in free theory and also realizes an example of Gopakumar's "open-closed-open" string triality. The form of the result supports the interpretation of the three-point function as an overlap between an integrable boundary state, which we determine using symmetry and integrability, and the state describing the single-trace operator. Second, we use thermodynamic Bethe ansatz to derive a non-perturbative expression for such overlap with an excited state in the SL(2) sector. Finally, we briefly discuss some interesting applications that could be addressed with the present methods.

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