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String Theory in Greater Paris

Rencontres Théoriciennes

“Supergravité, théorie des cordes et théorie M”

Jeudi 14 Décembre 2023, 11:45

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Computing four-point functions with integrability, conformal bootstrap and parity symmetry

In theories like N =4 Super Yang Mills, we have two remarkable sets of tools at our disposal : integrability and the conformal bootstrap, which encode different information. The combination of these two approaches can lead to accurate bounds for some nontrivial 3-point functions in the planar limit, particularly in the setup of defect observables built on a supersymmetric Wilson line. However, while the precision is very good for the OPE coefficients of low-lying states, higher in the spectrum it drops rapidly, limiting the possibility to reconstruct correlation functions. I will present a new approach which allows to deduce rigorous bounds directly for a 4-point function, adapting appropriately the numerical bootstrap algorithms. I will show how, supplemented with different types of information from integrability, this method leads to a very precise determination of the correlator. I will also discuss the implications of a previously unnoticed parity symmetry in the defect CFT and future directions.

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