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Bootstrapping line defects with $O(2)$ global symmetry

Wednesday 28 September 2022 16:00 (20 minutes)

Conformal Field Theories (CFTs), which appear as critical points of an array of physical theories, can be studied nonperturbatively by means of the conformal bootstrap. Recent advancements in especially the numerical bootstrap made it possible to obtain extremely precise results for critical exponents in various CFTs. CFTs can be generalized by adding extended objects (defects), which break the conformal symmetry group to a smaller, conformal subgroup. Defects connect different areas of physics: they appear as boundaries and impurities in low-energy condensed matter systems, as well as Wilson and 't Hooft operators in high-energy String Theories.
I will discuss recent work with A. Gimenez-Grau, E. Lauria and P. Liendo in which we explore 1d line defects with an additional $O(2)$ symmetry using the numerical bootstrap. The starting point is an agnostic approach, where we perfom a systematic bootstrap study of correlation functions between two canonical defect operators: the displacement and the tilt. We then move on to study two specific defects: a monodromy line defect and a localized magnetic field line defect. I will highlight the results of the latter one, where we found a series of intriguing cusps which we investigate.

Summary

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