Séminaire commun

The perturbative bootstrap of the Wilson-line defect CFT

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Résumé

Conformal line defects play a crucial role as observables in physics, with applications ranging from condensed-matter systems to high-energy physics. They also provide a valuable platform for studying new techniques in quantum field theory, as they break the conformal symmetry of the bulk theory in a controlled manner. The defect conformal field theory involving a Maldacena-Wilson line in N=4 supersymmetric Yang-Mills (SYM) theory is particularly compelling, as it preserves a significant portion of the supersymmetry and exhibits a one-dimensional CFT formed by correlators of excitations localized on the defect.

In this talk, I will introduce a perturbative bootstrap framework that enables the computation of correlation functions in this theory at weak coupling. This method integrates non-perturbative insights, such as superconformal symmetry, with minimal perturbative input. I will present new results for multipoint correlators of defect operators as well as bulk-defect-defect correlators. These correlators contain in principle a wealth of previously inaccessible CFT data and offer promising directions for further developments in the defect bootstrap program.