Mini workshop on the S-matrix bootstrap

Rapport sur les contributions

https://indico.in2p3.fr/e/miniSmatrix

ID de Contribution: **14** Type: **Non spécifié**

The Hybrid Bootstrap

vendredi 20 septembre 2024 10:00 (35 minutes)

In recent years, great focus has been given to analytical functionals to bootstrap extremal solutions to crossing. Current bootstrap methods mainly focus on determining the CFT data associated to the lowest lying operators. We will attempt to open a path towards approximating the full spectrum of extremal solutions in 1d by employing the powerful extremal functionals. Knowing the asymptotic behavior of both solutions and functionals, we rewrite crossing as an integral equation in the large Δ limit. This leads to the construction of a hybrid bootstrap : analytical solution of crossing in the UV, and standard numerical methods in the IR. Advantages and limits of this novel method will be discussed along with applications.

Orateur: SUCHEL, Noé

ID de Contribution: **15** Type: **Non spécifié**

The S-matrix Bootstrap with Neural Networks

vendredi 20 septembre 2024 10:35 (35 minutes)

I will introduce a new method for solving the unitarity equations in the S-matrix bootstrap framework using neural networks. This approach is designed to be applied to amplitudes that satisfy the Mandelstam representation, which helps ensure an accurate description of the fine structure of the scattering amplitude, particularly their double discontinuity. As an initial validation, we applied both our method and the standard bootstrap technique to a simplified toy model focusing on the S-wave unitarity condition. The resulting allowed regions show strong agreement, which highlights the potential of our method. Based on these promising results, we plan to extend our approach to solve the Mandelstam equation.

Orateur: LEFLOT, Damien

ID de Contribution: **17** Type: **Non spécifié**

Exploring the Spectrum of Consistent EFTs

vendredi 20 septembre 2024 11:55 (35 minutes)

I will discuss the implications of consistency conditions coming from Causality and Unitarity on the parameter space of Effective Field Theories (EFTs) of particles with spin J. I will show in particular that for $J \geq 2$, the mass must be parametrically close to that of the nearest UV excitation, thus reducing the range of applicability of such theories.

Orateur: RICOSSA, Sara

ID de Contribution: **18** Type: **Non spécifié**

Gong show

vendredi 20 septembre 2024 14:30 (50 minutes)

ID de Contribution: **19** Type: **Non spécifié**

Local conformal field theory from long range perturbation theory

vendredi 20 septembre 2024 15:50 (35 minutes)

Conformal field theory (CFT) can be studied using perturbative methods, such as the 4-epsilon expansion and the large N expansion. In this talk, I will introduce an alternative approach: a fixed-dimensional perturbation theory that incorporates long-range, non-local interactions. I will demonstrate that by imposing the conformal Ward Identity, it is possible to recover the data of local CFTs. By re-summing the perturbative series using long-range solitons, we obtain nice results for the critical exponents.

Orateur: RONG, Junchen (IHES, France)

ID de Contribution: **20** Type: **Non spécifié**

Non-invertible symmetries and scattering amplitudes.

vendredi 20 septembre 2024 16:25 (35 minutes)

Orateur: CORDOVA, Lucia