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Cosmological bootstrap in slow motion and the low speed collider

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Identifying the particle content of inflation is one of the most important targets of primordial cosmology. In this respect, how the masses and spins of new particles active during inflation can be read off from the statistical properties of primordial density fluctuations is well understood. However, not when the propagation speeds of the new degrees of freedom and of the curvature perturbation differ, which is the generic situation in the effective field theory of inflationary fluctuations. In this talk, I will explain how recently developed bootstrap techniques can be used to find exact analytical solutions for primordial 2-,3- and 4-point correlation functions in this context, and I will discuss the associated observational consequences. In particular, I will show the existence of new signatures of heavy fields when coupled to the curvature perturbation propagating at a reduced sound speed, manifesting in the form of resonances in the squeezed limit of the bispectrum, a phenomenon that we call the low speed collider. Based on 2205.10340

Primary author: RENAUX-PETEL, Sébastien

Presenter: RENAUX-PETEL, Sébastien

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