Seminar Fakulteta za fiziku

Vrijeme: srijeda, 12. veljače 2025. u 12:00

Mjesto: O-153, Fakultet za fiziku, Sveučilišni kampus, Radmile Matejčić 2

Jezik: engleski

From impossible to doable: complete function space for two-loop six-particle scattering amplitudes

Antonela Matijašić

PRISMA Cluster of Excellence, Institut fur Physik, Johannes Gutenberg-Universitat Mainz, Mainz, Germany

Abstract

The state-of-the-art in current two-loop QCD amplitude calculations is at fiveparticle scattering. In contrast, very little is known at present about two–loop six–particle scattering processes. One of the bottlenecks in the amplitudes computation is the lack of results for contributing Feynman integrals. In recent years, the results for one-loop hexagon integrals to higher order in the dimensional regulator have become available, as well as the results on the maximal cut of the planar two-loop six-point integral families. In this talk, I will show the progress made in computing planar two-loop six-particle Feynman integrals beyond the maximal cut using the differential equations method. In particular, I will discuss the canonical basis for all planar two-loop massless six-particle master integrals. After determining boundary conditions, the solutions may be written as Chen iterated integrals. Utilizing analytic solutions of differential equations and dihedral symmetry, we fully characterize the solution space relevant for two-loop six-particle computations. This is sufficient information for computing any four-dimensional scattering amplitude up to the finite part, thus overcoming the Feynman integral evaluation bottleneck and paving the way for future analytic calculations of six-particle scattering amplitudes.