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Type: Parallel Talk

Two-loop QED corrections to the di-muon production in $e^+ e^-$ collisions, and related processes

Thursday, 7 July 2022 12:20 (20 minutes)

In this talk, we present the analytic evaluation of the virtual corrections to the di-muon production in electron-positron collision in QED, up to the second order in fine structure constant, retaining the full dependence on the muon mass and considering the electron as a massless particle.

We discuss the computational details, and the high-level of automation it required, from the diagram generation, to the amplitude decomposition, and to the evaluation of the master integrals, along with the UV renormalization and the IR singularity structure.

We also present preliminary results on:

- i) a crossing related process, such as the two-loop amplitude for muon-electron scattering in QED, relevant for the MUonE experiment;
- ii) the extension to the process $q\bar{q} \rightarrow t\bar{t}$ in QCD.

In-person participation

Yes

Primary authors: RONCA, Jonathan (Istituto Nazionale di Fisica Nucleare); MANDAL, Manoj Kumar (Istituto Nazionale di Fisica Nucleare); Prof. MASTROLIA, Pierpaolo (Istituto Nazionale di Fisica Nucleare); TORRES BOBADILLA, William Javier (P)

Presenter: RONCA, Jonathan (Istituto Nazionale di Fisica Nucleare)

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