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AsyInt for massive multi-loop Feynman integrals in asymptotic limits

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In this talk, I will present the analytic tool AsyInt [1] for solving massive multi-loop Feynman integrals in asymptotic limits. AsyInt is currently optimized for high-energy (small-mass) expansions of massive two-loop four-point integrals and their analytic evaluations. Recently, AsyInt has been successfully employed to perform analytic two-loop electroweak calculations for double Higgs production at the LHC. In these calculations, highly non-trivial integrals involving the top quark, Higgs boson, and vector bosons are computed analytically at high energies, uncovering new elliptic constants as a by-product. This development represents the state-of-the-art in analytic electroweak calculations. I will outline the methodology and workflow of AsyInt, demonstrating its applicability to important LHC phenomenology.

[1] Hantian Zhang, “Massive two-loop four-point Feynman integrals at high energies with AsyInt”, JHEP 09 (2024) 069. (GitLab repository: <https://gitlab.com/asyint/asyint-public>)

Secondary track

T08 - Higgs Physics

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