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Particle Physics Seminars at IJCLab

Jeudi 26 Septembre 2024, 14 :00
IJCLAB, 100/2-A201 - Salle A201 (IJCLab)
Domaines : hep-ph

Titre : *Two-loop EW corrections to Higgs boson pair production & Feynman Integrals in Parameter Space*

Orateur : **Thomas Stone (University of Durham)**

Résumé : *In this seminar, I will present two topics on cutting-edge techniques in high-energy physics calculations. The first part will cover Yukawa-enhanced and Higgs self-coupling type electroweak corrections to di-Higgs production via gluon fusion. This involves the computation of a four-scale, two-loop amplitude retaining the exact symbolic dependence on all masses and scales. The resulting integrals are evaluated using sector decomposition and differential equation methods, with differential cross sections showing the corrections are most significant at low invariant mass and transverse momentum. The second part introduces an alternative approach to contour deformation for computing loop integrals in the Minkowski regime. By identifying and resolving singular hypersurfaces with blow-ups and sector decomposition techniques, this method improves convergence without requiring complex contour deformation. We demonstrate this technique on various examples, comparing its performance to traditional methods, and highlighting its potential for practical applications.*