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Systematic approximation of multi-scale Feynman integrals

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Abstract: An algorithm for the systematic analytical approximation of multi-scale Feynman integrals will be discussed. The algorithm produces algebraic expressions as functions of the kinematical parameters and mass scales appearing in the Feynman integrals, allowing for fast numerical evaluation. The results are valid in all kinematical regions, both above and below thresholds, up to in principle arbitrary orders in the dimensional regulator. The scope of the algorithm will be demonstrated by presenting results for selected two-loop three-point and four-point integrals with an internal mass scale that appear in the two-loop amplitudes for Higgs+jet production.

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