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Attacking one-loop multi-leg Feynman integrals with the Loop-Tree Duality method

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We present a first numerical implementation of the Loop-Tree Duality (LTD) method for the direct numerical computation of multi-leg one-loop Feynman integrals. We discuss in detail the singular structure of the dual integrands and define a suitable contour deformation in the loop three-momentum space to carry out the numerical integration. Then, we apply the LTD method to the computation of ultraviolet and infrared finite integrals, and present explicit results for scalar integrals and tensor integrals with up to six legs (hexagons). The LTD method exhibits an excellent performance independently of the number of external legs.

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