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Auxiliary mass flow method for master integrals around non-analytic points

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The calculation of phase-space integrals via reverse unitarity and differential equations often faces bottlenecks in fixing boundary conditions. In this talk we present a general and analytical method to derive boundary conditions for phase-space master integrals. Our strategy is based on the auxiliary mass flow method (AMFlow), but it is purely analytic. It is suited for the calculation of boundary conditions near the non-analytic endpoint region of phase space integrals, where a numerical approach is not feasible. It is based on the introduction of an auxiliary mass to some properly chosen propagators, on the construction and subsequent solution of a DE system with respect to the auxiliary mass and an analytic flow to vanishing auxiliary mass for recovering the physical solution. We present some applications to DIS-like phase space integrals at two-loops and an outlook to three-loops.

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