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Numerical multi-loop calculations: tools and applications

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In higher order calculations, multi-dimensional parameter integrals, containing also various types of singularities, are ubiquitous. We will present the program SecDec, which allows to isolate the singularities and numerically calculate their coefficients in a process-independent way. Therefore it can be used as a building block for the automation of higher order corrections beyond next-to-leading order, as a tool to provide numerical results for the master integrals occurring in an amplitude. We report on new features of the program which are devised towards this aim and give some illustrations, in particular for two-loop integrals with several mass scales.

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