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Title:	Master integrals for $O(\alpha_s)$ corrections to $H \rightarrow ZZ^*$
Authors:	Kaur, Mandeep (/jspui/browse?type=author&value=Kaur%2C+Mandeep) Shivaji, Ambresh (/jspui/browse?type=author&value=Shivaji%2C+Ambresh)
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Abstract:	We present analytic results for all the Feynman integrals relevant for $O(\alpha_s)$ virtual corrections to $H \rightarrow ZZ^*$ decay. We use the method of differential equations to solve the master integrals while keeping the full dependence on the masses of all the particles, including those propagating in the loop. Due to the presence of four mass scales, we encounter multiple square roots. We argue that all the occurring square roots can not be rationalized at the same time as a simultaneous rationalization brings us to integrals over CY3 manifolds. Hence we rationalize only three square roots simultaneously and construct suitable ansätze to obtain dlog-forms containing the square roots after obtaining an epsilon-factorised form for the differential equations in $D = 4 - 2\epsilon$ dimensions. We present the alphabet and the analytic form of all the boundary constants that appear in the solutions of the differential equations. The results for master integrals are expressed in terms of Chen's iterated integrals with dlog one-forms.
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