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Unstable-particles pair production in modified perturbation theory in NNLO

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We consider pair production and decay of fundamental unstable particles in the framework of a modified perturbation theory (MPT) which treats resonant contributions of unstable particles in the sense of distributions. The cross-section of the process is calculated within the NNLO of the MPT in a model that admits exact solution. Universal massless-particles contributions are taken into consideration. The calculations are carried out by means of FORTRAN code with double precision which ensures a per mille accuracy of the computations. A comparison of the outcomes with the exact solution demonstrates an excellent convergence of the MPT series at the energies close to and above the maximum of the cross-section. Near the maximum of the cross-section a discrepancy of the NNLO approximation makes up a few per mille.

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