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Monte Carlo KKMCee 5.00 for lepton and quark pair production in lepton colliders

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KKMCee version 5.0 Monte Carlo event generator is for lepton and quark pair production for the high energy electron-positron annihilation process. It is the most sophisticated event generator for such processes. Its entire source code is now re-written in the modern C++ language (to be included in the FCCee software soon). It reproduces all features of the older KKMC code in Fortran 77. However, a number of improvements in the Monte Carlo algorithm are also implemented. Most importantly, it is intended to be a starting point for the future improvements, which will be mandatory for the future high precision lepton collider projects. As in the older version, in addition to higher order QED corrections, it includes so-called $\alpha^{1.5}$ genuine weak corrections using a version of the classic DIZET library and polarized τ decays using TAUOLA program. Both DIZET and TAUOLA external libraries are still in Fortran 77. In addition, a HEPMC3 interface to other MC programs, like parton showers and detector simulation, replaces the older HepEvt interface. It is also instrumental in adding the additional photon final state emissions in τ decays using an external PHOTOS library rewritten in C.

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