

Monte Carlo Event Generator updates with tau pair events at Belle II energies

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The Monte Carlo for lepton pair production and tau decays consist of KKMC for lepton pair production, Tauola for tau lepton decays and Photos for radiative corrections in decays.

An effort for adaptation of the system for precision data to be collected at Belle II experiment lead to extension of phase space generation modules both in Photos and Tauola to enable decays and/or radiative corrections with emission of additional light lepton pairs. The phase-space and matrix element parts are separated, that is why extension is useful for processes where lepton pair is produced through narrow resonances, like dark photon or dark scalar candidates.

List of tau decays is enriched with multitude of exotic decay channels useful for new physics searches. The hadronic currents parameterizations of main decay channels is prepared for basic simulation in the experiment. The basis for future work on precise fits of hadronic currents including Machine Learning is retained, but development of necessary software solutions is left for the forthcoming years.

Programs are now available in stand-alone format or through the Basf2 system of Belle II software as well.

What is your topic?

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