

PYTHIA vs. HERWIG: Monte Carlo reliability for Dark Matter gamma ray searches

Wednesday, 11 September 2013 19:30 (2h 30m)

We have analyzed the gamma ray spectra produced by four Monte Carlo event generator packages developed in particle physics, PYTHIA and HERWIG. These spectra have been largely used in the framework of dark matter indirect searches and the differences between them may affect the results for those investigations. Two different versions of PYTHIA and two of HERWIG are analyzed, namely PYTHIA 6.418 and HERWIG 6.6.10 in Fortran and PYTHIA 8.165 and HERWIG 2.6.1 in C++. The intrinsic differences between them are shown to be significative and may play an important role in misunderstanding dark matter signals.

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Session Classification: Poster Session

Track Classification: Dark Matter