

1. Calculate the SM Higgs boson width for  $m_H = 125$  GeV using PYTHIA8.
2. Simulate 1000 SM Higgs events with PYTHIA8 for  $m_H = 125$  GeV using CTEQ6L1 structure functions. Use ROOT to plot the Higgs boson mass distribution and calculate the (Breit-Wigner) width from the plot.
3. (Voluntary) Latest versions of the GCC compiler considers "Type mismatch in COMPLEX(8) to REAL(8)" as an error. This can be bypassed by a compiler option `-fallow-argument-mismatch`. Write a **sed** script to change the HDECAY makefile to have "FFLAGS = `-fallow-argument-mismatch`".

Please push your answers into your public git repository.