Luminosity

Concerning the work done on the topic of precision luminosity, a particular effort was done to arrive at an up-to-date estimate of the accuracy of the most precise MC tools used by the experimentalists.

Several tuned comparisons between the predictions of independent generators were presented, considering the large-angle Bhabha process with realistic event selection criteria and at different c.m. energies. It emerged that the three most precise luminosity tools, i.e. BabaYaga@NLO, BHWIDE and MCGPJ, agree within 0.1% for the integrated cross sections and within 1% (or better) for the distributions. Therefore the main conclusion of the work on tuned comparisons is that the technical precision of MC programs is well under control, the (minor) discrepancies still observed being due to slightly different details in the treatment of the same sources of radiative corrections and their technical implementation.

The theoretical accuracy of the generators, as due to partially accounted radiative corrections, was assessed by performing detailed comparisons between the results of the generators and those of exact perturbative calculations. In particular, explicit cross-checks with the predictions of available NNLO QED calculations and with new exact results for lepton and hadron pair corrections led to the conclusion that the total theoretical uncertainty is at the one per mille level for the large-angle Bhabha process at different c.m. energies. Albeit this error estimate could be put on firmer grounds thanks to further work in progress, it appears to be already quite robust and sufficient for precision luminosity monitoring.