

# Precision QCD simulations for the LHC with Sherpa

*Tuesday, 29 August 2017 12:00 (30 minutes)*

The improvements of Monte-Carlo event generators in the last decade enable quantitative predictions for the LHC at an unprecedented accuracy.

Combining matrix elements at next-to-leading order in QCD with parton-shower emissions ("matching") and using (N)LO matrix elements for hard emissions at different final-state multiplicities ("merging") led to considerably reduced theoretical uncertainties. There are also ongoing efforts to integrate NNLO matrix elements within these algorithms, reducing the theory uncertainties even more.

In my talk I will review the state-of-the-art of these methods in the context of the Monte-Carlo event generator Sherpa, along with other recent Sherpa developments. In particular, I will present the newly added reweighting methods that allow to efficiently determine the QCD matrix-element and parton-shower uncertainties without generating additional Monte-Carlo samples.

**Primary author:** BOTHMANN, Enrico (University of Edinburgh)

**Presenter:** BOTHMANN, Enrico (University of Edinburgh)

**Session Classification:** Resummation and Monte Carlo generators