Kluth

Determination of the top quark mass with ATLAS data and complete resonant NLO calculations in the lepton+jets channel

We propose to improve the extraction of the top quark mass from ATLAS data using complete resonant next-to-leading order (NLO) calculations matched to a Monte Carlo Generator. The total errors of the top quark mass from ATLAS are already at the percent level. At this level theoretical errors arising from uncertainties in the theory needed to model the data as a function of the top quark mass become important. In order to better control these uncertainties we propose to use complete NLO calculations for the complex final states in top-antitop production at the LHC matched to Monte Carlo event generators, because in this way can use the improved calculations together with the existing highly optimised top quark mass analyses in ATLAS. Complete NLO calculations matched to Monte Carlo generators are a recent theoretical development and we want to focus on validating and adjusting to data (tuning) of the improved generators as well as on integrating the new predictions into the ATLAS analyses.