

Sensitivity studies of color reconnection in top underlying events measurements

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Sensitivities studies of color reconnection (CR) effects in top-antitop underlying events (UE) were performed for the fully leptonic and fully hadronic final states (FLFS and FHFS respectively) events. A new Tune for the new CR [1] reconnection model parameters implemented in PYTHIA [2] is tested based on Rivet [3] routines. Effects of CR were studied based on a new Rivet Analysis. Differences between predictions with and without CR were observed of $\sim 8-15\%$ for two of the investigated observables, as well as for predictions considering a variation of the fragmentation parameters. For different color reconnection models, effects around 5% were observed. No differences for predictions with and without CR between FLFS and FHFS were found for all the observables. A comparison between the prediction of the new CR model and the former one is presented through the application of the Rivet Analysis. This study shows the sensitivity of the UE observables to CR effects and may help to lower the uncertainties due to the UE simulation in top mass measurements.

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