Application of the Fully Bayesian Unfolding in the top pair charge asymmetry measurement

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Measurements of top quark properties provide possibilities to test the Standard Model predictions and probe BSM scenarios.

Top quark pair production charge asymmetry, $A_{\rm C}^{t\bar{t}}$,

manifests itself as asymmetry in the differential cross section under the exchange of t and \bar{t} quark in the final state. In the SM, $A_{\rm C}^{t\bar{t}}$ is zero at LO calculation and is non-zero in higher order corrections. Thus, charge asymmetry is sensitive to possible BSM contributions.

To correct for detector and reconstruction response, an unfolding procedure is applied to measured data. Due to large amount of data collected in Run², systematic uncertainties have significant impact on precision of the measurement.

The technique of the Fully Bayesian Unfolding (FBU), which allows natural inclusion of systematic uncertainties via nuisance parameters, is employed. The FBU implementation is presented in the context of the Run² $t\bar{t}$ charge asymmetry measurement.

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