Muons are reconstructed in the MS and associated to ID tracks; the ID track is extrapolated to the MS. Reconstructed muons are then matched to the muon tracks from the calorimeter.

The data-driven calibration of the simulated muon momentum resolution and scale is obtained using a simultaneous template fit of \(Z_{\mu\mu} \rightarrow \mu\mu\) and \(J/\psi_{\mu\mu}\) events. The momentum scale is known to better than 1%, in order to obtain such level of agreement between data and simulation a set of corrections is applied: \(p_T\) and \(\eta\) distributions of the \(Z\) and \(J/\psi\) resonances in simulation are reweighted to the distributions observed in data.

Dimuon invariant mass distribution (combined muons) with the muon momentum corrections applied (up). Transverse momentum \(p_T\) resolution as a function of pseudorapidity \(\eta\). Muons are reconstructed combining Inner Detector and Muon Spectrometer tracks (left).