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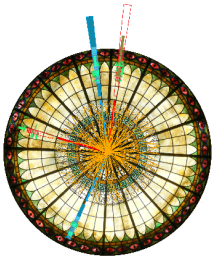

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A New Method for Indirect Mass Measurements using the Integral Charge Asymmetry at the LHC

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We propose a novel method for an indirect measurement of the mass of final states
produced through charged current processes at the LHC. This method is based upon the process integral charge asymmetry. First, the theoretical prediction of the integral charge asymmetry and its related uncertainties are studied through parton level cross sections calculations. Then, the experimental extraction of the integral charge asymmetry of a given signal, in the presence of some background, is performed using particle level simulations. Process dependent templates enable to convert the measured integral charge asymmetry into an estimated mass of the charged final state. Finally, a combination of the experimental and the theoretical uncertainties determines the full uncertainty of the indirect mass measurement. This new method applies to all charged current processes at the LHC. In this study, we demonstrate its effectiveness at extracting the mass of the W boson, as a first step, and the sum of the masses of a chargino and a neutralino in case these supersymmetric particles are produced by pair, as a second step. Note that contrarily to most of the usual mass reconstruction techniques that are based upon the kinematics of the events final state, this method depends on the events initial state and mainly reflects the charge asymmetry of the colliding protons.

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