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BEST: Bi-Event Subtraction Technique, SUSY Mediation Schemes, and Stop/Top/W Masses at the LHC

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Abstract:

In this talk, I will describe the Bi-Event Subtraction Technique (BEST), a method we have developed which models and subtracts large portions of combinatoric background during reconstruction of particle decay chains at hadron colliders. BEST is very useful in the determination of superpartner as well as top/W masses through endpoint measurements of kinematic observables arising from cascade decays. We demonstrate two applications of BEST: (1) reconstruction of gaugino masses, gaugino unification scale, and hence hints about the underlying SUSY-breaking mediation scheme and (2) reconstruction of third generation squark masses which may be important in Natural Supersymmetry scenarios, as well as top/W masses.

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