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Particle Mass Measurements from Extreme Event Reconstruction and Focus Points

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We investigate the solvability of the event kinematics in missing energy events at hadron colliders, as a function of the particle mass ansatz. To be specific, we reconstruct the neutrino momenta in dilepton $t\bar{t}$ -events, without assuming prior knowledge of the top, W and neutrino masses. We identify a class of events, which we call *extreme events*, with the property that the boundary of their allowed region in mass parameter space passes through the true mass point. We show that the collection of such *extremeness boundaries* is focused on the true values of the mass parameters and can be effectively used for mass determination. We derive a kinematic variable which allows us to recognize a given event as extreme.

Summary

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