

XVth Quark Confinement and the Hadron Spectrum



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The transverse momentum reconstruction and implications for the W-boson mass

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We discuss a tantalizing possibility that misinterpretation of the reconstructed missing momentum may have yielded the observed discrepancies among measurements of the W-mass in different collider experiments. We introduce a proof-of-principle scenario characterized by a new physics particle, which can be produced associated with the W-boson in hadron collisions and contributes to the net missing momentum observed in a detector. We show that these exotic events pass the selection criteria imposed by various collaborations at reasonably high rates. Consequently, in the presence of even a handful of these events, a fit based on the ansatz that the missing momentum is primarily due to neutrinos (as it happens in the Standard Model), yields a W-boson mass that differs from its true value. Moreover, the best fit mass depends on the nature of the collider and the center-of-mass energy of collisions.

Primary author: ROY, Tuhin (Tata Institute of Fundamental Research)

Presenter: ROY, Tuhin (Tata Institute of Fundamental Research)

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