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Precision Top Quark Mass From a Simultaneous Fit in l+j and l+l Channels Using 2fb^-1

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We present a measurement of the top quark mass employing the template method with data samlpe collected by the CDF Run II detector corresponding to integrated luminosity of 2fb^-1. Lepton+Jets and Dilepton final states are selected. For each event in the Lepton+Jets channel we apply kinematic constraints on the pair of top quarks and their decay products to determine a reconstructed top quark mass. We simultaneously determine the invariant mass of the decaying W boson to calibrate the energy response of the detector. The events in the Dilepton sample are reconstructed using the Neutrino Weighting Algorithm, where integration over undetermined kinematic variables is necessary due to presence of two neutrinos in the event. To improve the precision, for each Dilepton event we calculate Ht - the linear sum of missing transverse energy and transverse momenta of jets and leptons The reconstructed top quark mass and W boson invariant mass distributions from the Lepton+Jets channel and reconstructed top quark mass and Ht distributions from the Dilepton channel are fit to Monte Carlo derived templates in a likelihood fit to extract the top quark mass and an in-situ measurement of the jet energy scale. We measure Mtop=171.9+/-2.0 GeV/c^2.

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