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Measurements of the top quark mass and width with the D0 detector

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We present measurments of the top quark mass and width obtained using a data sample corresponding to 5.4 fb-1 of integrated luminosity collected with the D0 detector at the Fermilab Tevatron collider. The top quark mass is obtained via the direct reconstruction of the two t−>Wb decays in ttbar events selected in the dilepton+jets+missing transverse energy and lepton+jets+missing transverse energy final states. We discuss the various techniques used to extract the top mass and the recent reductions of some of the systematic uncertainties. The top mass is also derived from the measurement of the production cross section using higher-order quantum chromodynamics calculations in two different renormalization schemes, and the results of this derivation are compared with those obtained from the direct reconstruction. We also investigate for possible differences in the mass of the top quarks and antiquarks and present a derivation of the totap width of the top quark obtained from the partial decay width Gamma(t−>Wb) and from the measurement of the single top quark production via t-channel diagrams.

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