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Top quark mass measurement in the dilepton channel at CDF using a neural network event selection and matrix element method RAVI SHEKHAR, Duke University, CDF COLLABORATION — We present a measurement of the top quark mass using events in the dilepton decay channel. The events used in this analysis are selected using a genetically-evolved artificial neural network that is optimized directly for precision in the top quark mass measurements. This is the first application of this method in high energy physics. We extract the top quark mass from a probability that a given event is consistent with $t\bar{t}$ decay in the dilepton channel. The probability is evaluated using the differential cross-section for ttbar production and decay. The effect of background events in the sample is accounted for by evaluating differential cross sections for major background processes. Using 2 fb^{-1} of $p\bar{p}$ data collected at the CDF II detector, we measure $m_t = 171.2 \pm 2.7(\text{stat.}) \pm 2.9(\text{syst.})$ GeV/c^2. We discuss the gain in sensitivity due to the use of the evolving neural network.

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