are quoted for electron and muon candidates that have already passed the trigger requirements discussed earlier.

Neutrinos can only be detected by requiring that they have sufficient transverse energy that the total measured energy flow sum to a value inconsistent with zero. In practical terms, this energy flow vector is known as missing transverse energy ($\not{E}_T$). Note that we cannot use the imbalance in energy flow along the beamline in this case as one can expect a significant imbalance due to the differing momentum of the partons in the proton and antiproton that collide to produce the $t\bar{t}$ system. The resolution in $\not{E}_T$ is driven by both the uniformity of the calorimeter and its inherent energy resolution. DØ has a missing transverse energy resolution in each transverse coordinate of

$$\sigma_x = 1.08 + 0.019 \left(\sum E_T\right) \text{ GeV}, \tag{11}$$

where the summation gives the total scalar transverse energy observed in the calorimeter. CDF's transverse energy resolution is approximately 15-20% worse, which has a modest impact on its neutrino detection ability.

Jets are constructed in both detectors as clusters of transverse energy within a fixed cone defined in $\eta - \phi$ space [18]. The size of this cone is determined by the competing requirements of making it large enough to capture most of the energy associated with the fragmentation of a quark or gluon, and yet small enough that it doesn't include energy associated with nearby high energy partons or from the "underlying" event. The latter effect in itself contributes on average approximately 2 GeV per unit in $\eta - \phi$ space, but fluctuations in the underlying event affect the jet energy resolution (the size of this effect depends on the rate of multiple interactions). Monte Carlo (MC) calculations using a variety of models for quark fragmentation and underlying event assumptions, as well as studies of the underlying events have indicated that a jet cluster cone size substantially smaller than the traditional $\eta - \phi$ radii of 0.7 or 1.0 employed in QCD studies is required. The CDF analysis employs a cone cluster size of 0.4 in its top quark search, whereas the DØ collaboration has chosen to work with a cone size of 0.5.

The reconstruction of the final state partons and the requirement that most if not all daughters are reconstructed is not sufficient to reject all backgrounds to $t\bar{t}$ production. There are other kinematical variables that discriminate between $t\bar{t}$ and background events, most of them taking advantage of the fact that heavy top quark production will generate final state daughters that are on average quite energetic. This motivates the use of a variable called H_T defined as

$$H_T = \sum_{i=1}^{N_p} E_T^i, \tag{12}$$

where the sum is over all the jets and the leading electron cluster (in those channels where at least one electron is required). This variable is used by the DØ collaboration