Supplemental material to model-independent measurement of t-channel single top quark production in $p\bar{p}$ collisions at $\sqrt{s} = 1.96$ TeV

The D0 Collaboration

I. DISCRIMINATING VARIABLES

Distributions for some discriminating variables used by the multivariate methods are shown in Figs. 1-4. The hatched regions represent the systematic uncertainties on the background predictions.

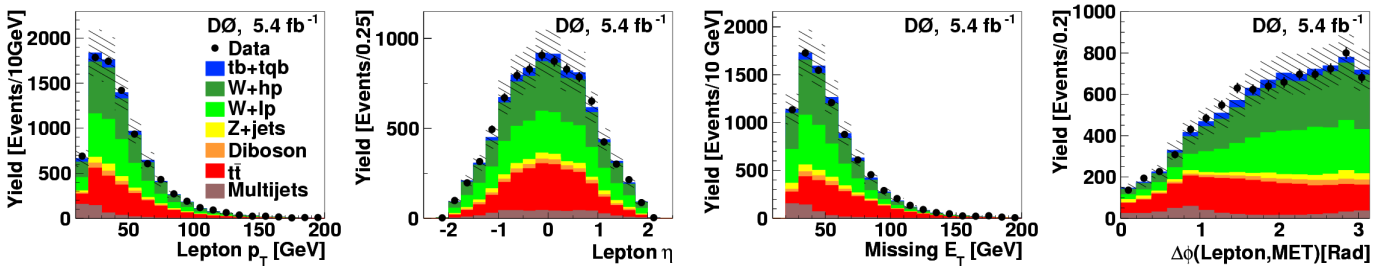

FIG. 1: Lepton and MET kinematic distributions.

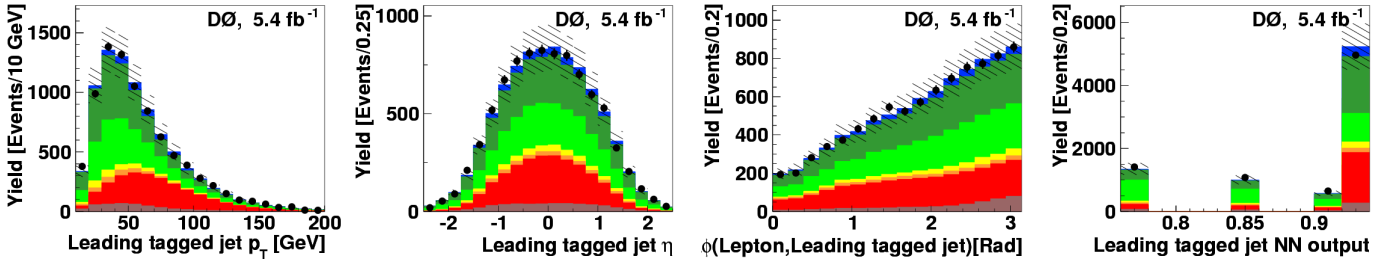

FIG. 2: Leading tagged jet kinematic distributions.

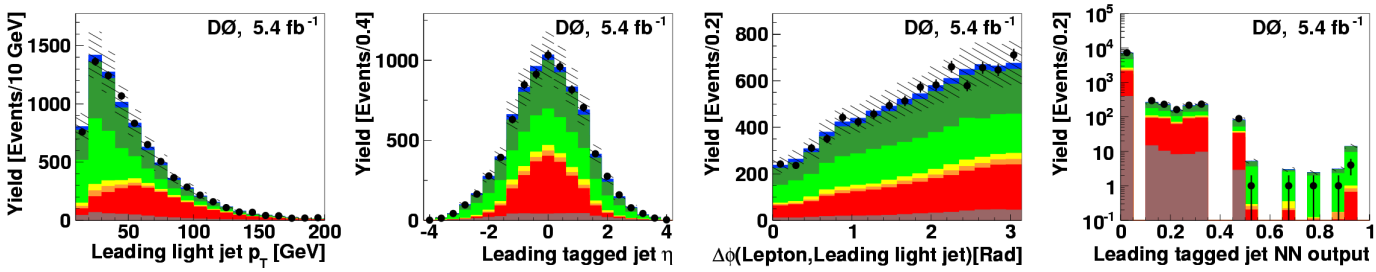

FIG. 3: Leading light jet kinematic distributions.

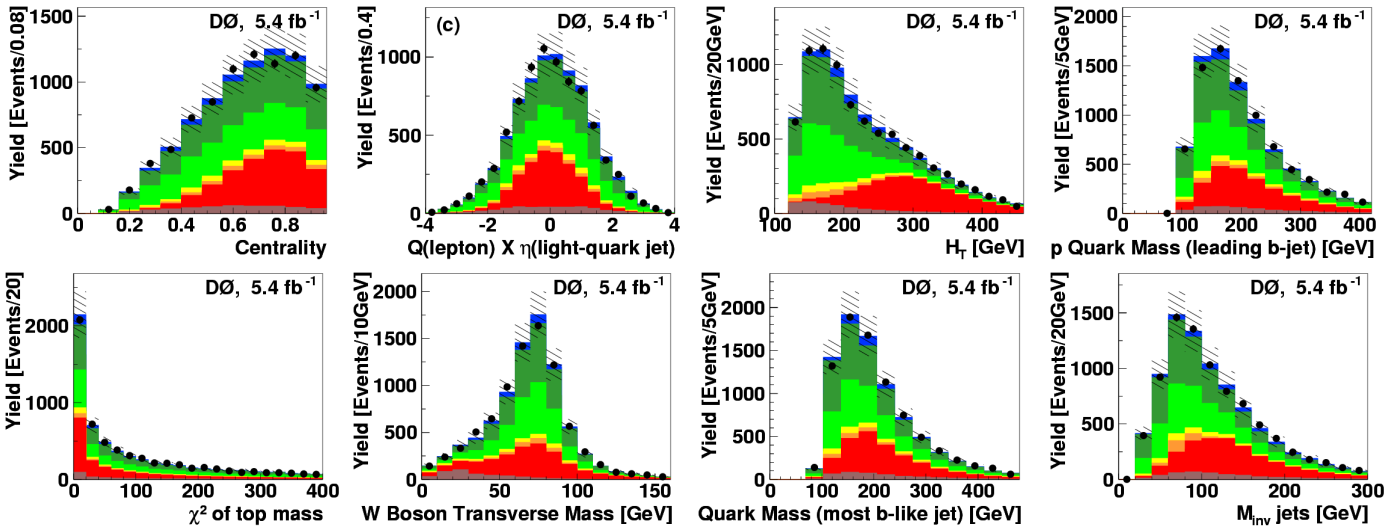

FIG. 4: Variables with largest discriminating power.

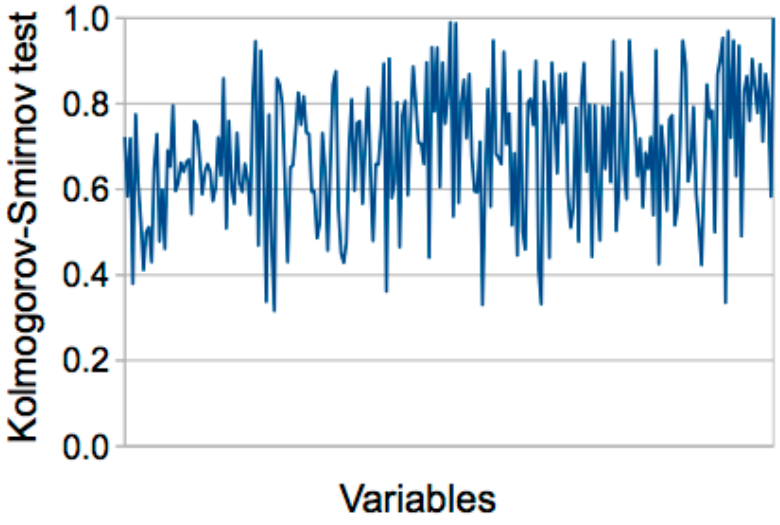

FIG. 5: Mean Kolmogorov-Smirnov test (KS) evaluated for the six analysis channels for a common set of well-modelled variables. The x axis is given by an index which enumerates all the different variables within the set of well-modelled variables. For the single top quark production cross section we use the SM value.

II. CONTROL SAMPLES

We observe good agreement for both normalization and shape when comparing data with prediction in the W+jets and $t\bar{t}$ dominated samples (defined above), as can be seen in Fig. 6 and 7, respectively.

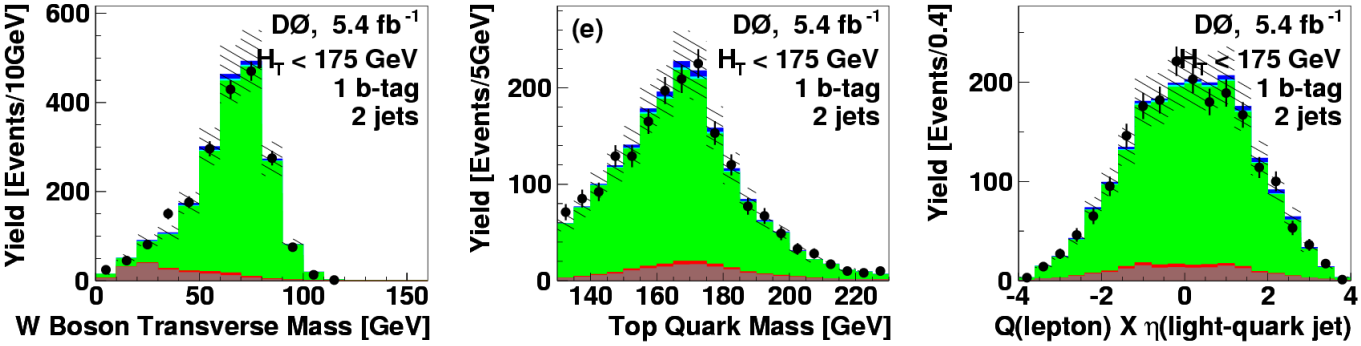

FIG. 6: W+jets control sample.

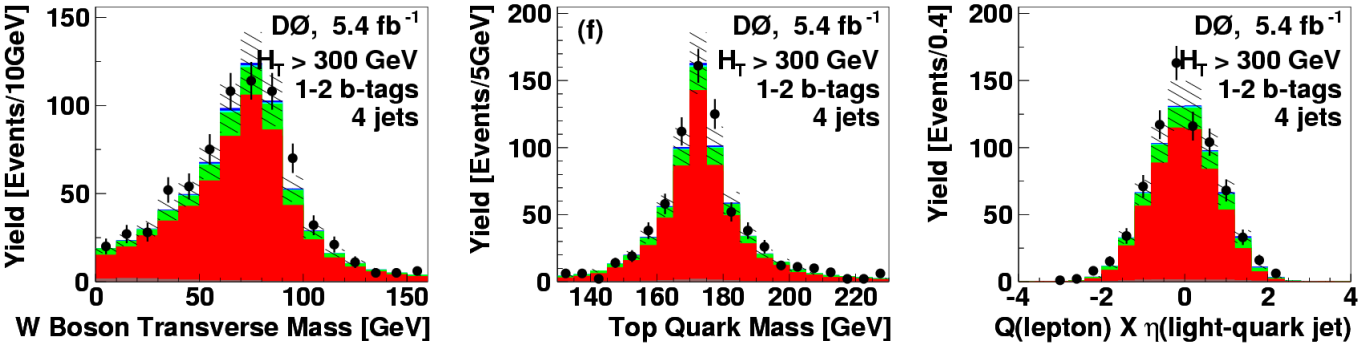

FIG. 7: $t\bar{t}$ control sample.

III. SIGNAL PLOTS

MC comparison to data selected with different values of S:B using the combined descriminant for t-channel.

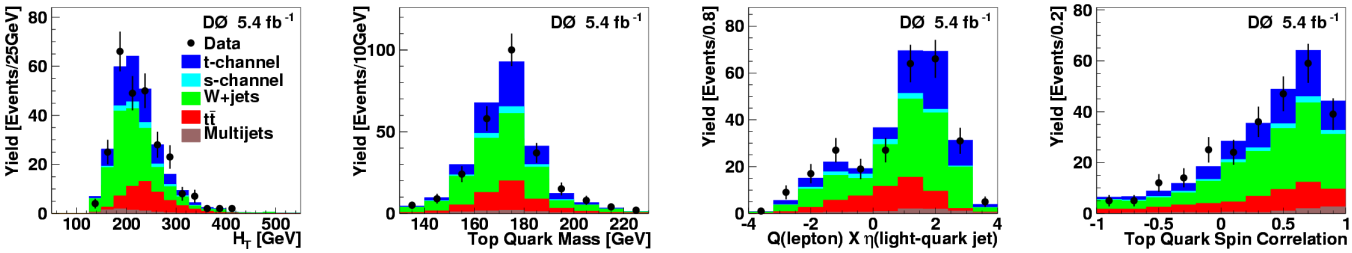

FIG. 8: Plots after cutting S:B > 0.16.

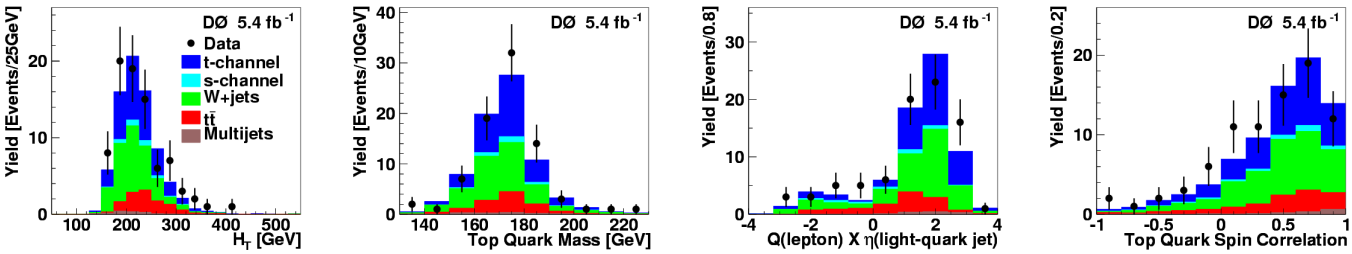

FIG. 9: Plots after cutting S:B > 0.32.

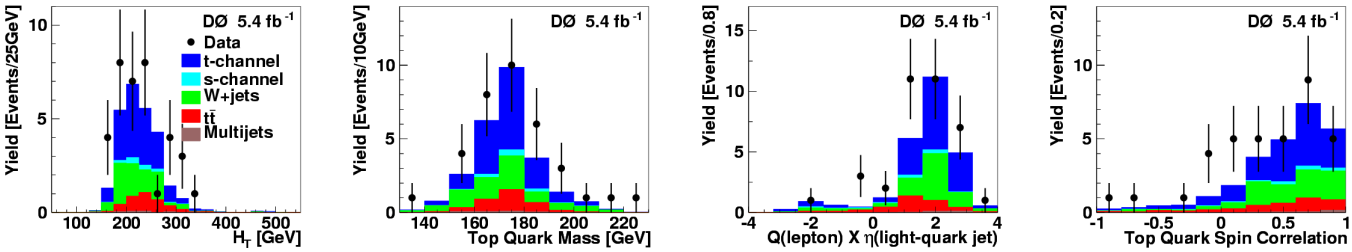

FIG. 10: Plots after cutting S:B > 0.50.