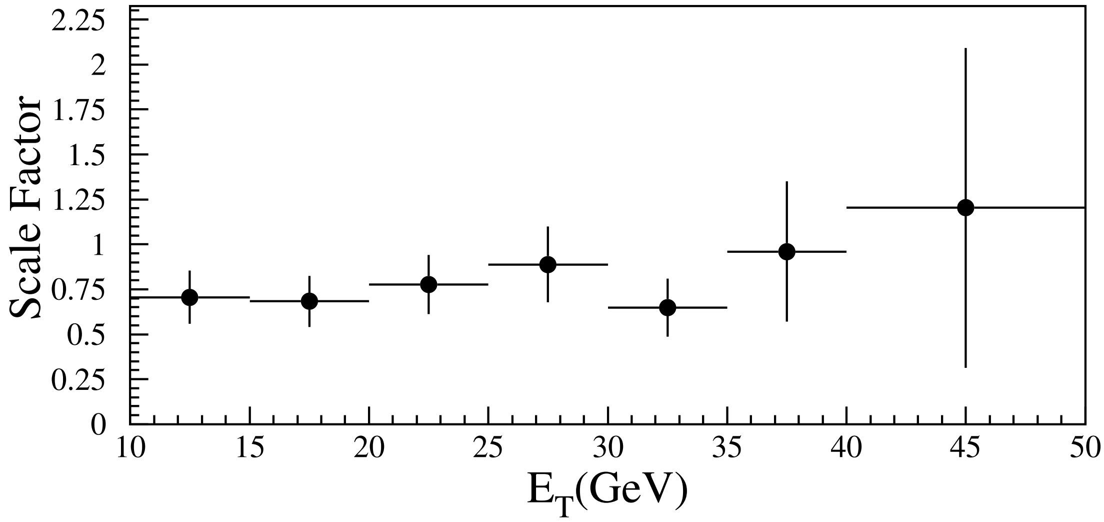

Figure 24: The SVX tagging efficiency in the inclusive electron data divided by the SVX tagging efficiency in a Monte Carlo sample of semileptonic B decays.

The systematic uncertainty assigned to the determination of the Monte Carlo scale factor is ± 0.21 (29%) and is dominated by a ± 0.17(23%) systematic uncertainty in its $\mathrm{E_T}$ dependence. We estimate this effect by taking a $\pm$ 1 σ variation in the slope of a linear fit to Figure 24, weighted by the $\mathrm{E_T}$ spectrum of b jets from $t\bar{t}$ events. The systematic uncertainty also includes an uncertainty due to limited statistics on the number of double tags, and an uncertainty on the b fraction of the electron sample. The Monte Carlo simulation has a higher SVX tracking efficiency and slightly better impact-parameter resolution than the data. However, these discrepancies can only account for approximately 1/3 of the data-Monte Carlo difference. The fact that the SVX b-tagging efficiency is lower than expected does not affect the statistical significance of the results reported here, but does enter into the cross section calculation as discussed in Section 7.

The event-tagging efficiency ϵ_{tag} measures the efficiency for tagging at least one b jet in a $t\bar{t}$ event with 3 or more observed jets. For the jet-vertexing algorithm, ϵ_{tag} is determined using ISAJET $t\bar{t}$ Monte Carlo events for various top masses and the CLEO parametrization for the decay of the B mesons. Table 18 gives ϵ_{tag} and the number of expected SVX b-tagged events for various values of the top mass. These estimates include corrections for the scale factor and the effect of inefficiency for events with primary vertices outside the SVX fiducial volume. Tagging efficiencies measured for the other two b-tagging algorithms are similar to the tagging efficiencies measured for the jet-vertexing algorithm.

For a top mass of 160 GeV/c^2, ϵ_{tag} can be factorized as follows: Of the $t\bar{t}$ events which pass the $N_{jet} \geq$ 3 requirement, 67% have at least one b jet within the SVX fiducial volume. Of these events, 91% have at least one b jet with two or more tracks which pass the jet-vertexing selection criteria. Of these selected events, 36%