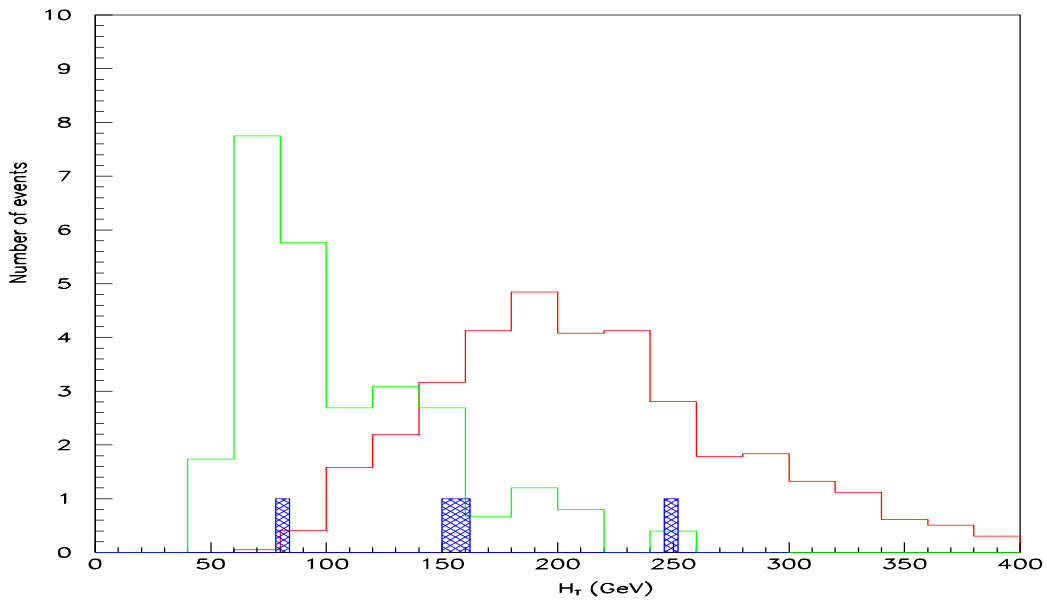

Figure 6: H_T distribution of the DØ dilepton candidate events (shaded histograms). 2 $e\mu$ events with $H_T > 120$ GeV, 1 $\mu\mu$ event with $H_T > 100$ GeV, and 1 ee event failing the minimum H_T requirement of 120 GeV. Shape of H_T distributions (dotted histograms) expected for the principal backgrounds (lower mean) and 200 GeV/c^2 top quarks (higher mean) for $e\mu$ events.

and to pass lepton identification cuts. An inclusive W boson sample is made by requiring $\not\!\!E_T > 20$ GeV after Z event removal. Table 4 classifies the W events by the number of jets with observed $E_T > 15$ GeV and $|\eta| < 2.0$. The number of observed W+multijet events decreases by an approximate factor of α_s for each additional jet. In contrast, the $t\bar{t}$ decay to $WWb\bar{b} \rightarrow$ lepton $+ \nu +$ jets ($q\bar{q}b\bar{b}$) produces, on average, three or four reconstructed jets. The "signal region" with $W+ \geq 3$ jets retains most of the expected $t\bar{t}$ events (70% of the 175 GeV/c^2 top signal), while removing the large majority of W+multijet background events. CDF select 203 events with $W+ \geq 3$ jets in which about 30 $t\bar{t}$ events are expected in the 67 pb^{-1} data for a top quark mass of 175 GeV/c^2. Therefore, additional background rejection is needed.

To obtain a further reduction of the QCD W+multijet background, CDF looks for b quarks in W+jet events by two different methods. The first method makes use of the new Silicon Vertex Detector (SVX)[10] to find secondary displaced-vertices from b quark decay (SVX tagging) based on b-hadron lifetime of $c\tau \sim 450\mu$. The vertex-finding efficiency is significantly larger now than previously due to an improved vertex-finding algorithm and the performance of the new vertex detector. The previous vertex-finding algorithm searched for a secondary vertex with 2 or more tracks. The new algorithm first searches for vertices with 3 or more tracks with looser track requirements, and if that fails, searches for 2-track vertices using more stringent