Motivation

The standard lepton + jets mass analysis uses a sample of events which have at least 4 jets passing certain kinematic criteria and have at least one SVX or SLT b-tag in the 4 highest E_T jets. The kinematic cuts on the jets are:

- $E_T > 15\ GeV/c^2$ and $\eta < 2$ for the 3 highest E_T jets
- $E_T > 8\ GeV/c^2$ and $\eta < 2.4$ for the fourth jet

The standard mass analysis does not:

- Take into account the difference in signal-to-noise between SVX and SLT tagging.
- Make use of the untagged events which pass the kinematic requirements for top events.

We have altered the standard mass analysis so that it makes optimal use of our present data sample.

Optimization Method

- We divide the pretagged sample into non-overlapping subsamples.
- The subsamples are orthogonal and can be combined as uncorrelated samples.
- We multiply the likelihoods from each subsample together to get a combined likelihood.
- We fit the combined likelihood to a parabola to obtain a mass and its statistical uncertainty.
- The combination of subsamples which gave the smallest statistical uncertainty in Monte Carlo studies is:
  - single SVX tags
  - double SVX tags
  - SLT tags (no SVX tags)
  - untagged events where the fourth highest E_T jet is required to pass the same kinematic cuts as the first three; $E_T > 15$ and $\eta < 2$