Appendix A

Monte Carlo Samples

A number of MC samples are utilized in this analysis and referred to throughout the text. Below is a list of the MC samples used and an explanation of what the sample names mean.

A.1   List of Samples

1. Drell-Yan + up to 2 hard jets:

   `/DYJetsToLL_TuneZ2_M-50_7TeV-madgraph-tauola/`

   `Fall11-PU_S6_START42_V14B-v1/AODSIM`

2. QCD enriched with B and D meson decays to electrons:

   `/QCD_Pt-20to30_BCtoE_TuneZ2_7TeV-pythia6/`

   `Fall11-PU_S6_START42_V14B-v1/AODSIM`,

   `/QCD_Pt-30to80_BCtoE_TuneZ2_7TeV-pythia6/`

   `Fall11-PU_S6_START42_V14B-v1/AODSIM`,

   `/QCD_Pt-80to170_BCtoE_TuneZ2_7TeV-pythia6/`

   `Fall11-PU_S6_START42_V14B-v1/AODSIM`

3. Photon + jet doubly enriched with jets passing an EM filter:

```
/GJet_Pt-20_doubleEMEnriched_TuneZ2_7TeV-pythia6/

Fall11-PU_S6_START42_V14B-v1/AODSIM
```

4. W leptonic decays + up to 2 hard jets:

```
/WJetsToLNu_TuneZ2_7TeV-madgraph-tauola/

Fall11-PU_S6_START42_V14B-v1/AODSIM
```

5. $t\bar{t}$ + up to 2 hard jets:

```
/TTJets_TuneZ2_7TeV-madgraph-tauola/

Fall11-PU_S6_START42_V14B-v2/AODSIM
```

A.2 Explanation of Naming Conventions

- `L`: charged lepton

- `B`: B hadron

- `C`: D, or charmed, hadron

- `E`: electron or positron

- `G`: photon

- `W`: W boson

- `Nu`: neutrino

- `T`: top quark

- `TuneZ2`: Pythia tune incorporating 2010 LHC data with CTEQ6L1 [?] PDFs [?]

- `M-50`: Generated l^+l^- invariant mass threshold of 50 GeV

- `7TeV`: Generated center-of-mass energy 7 TeV

- `pythia6`: Parton showering and hadronization simulated with Pythia v6.424 [**?**]

- `madgraph`: Hard interaction generated with MadGraph 5 [**?**]

- `tauola`: τ decays generated with Tauola [**?**]

- `PU_S6`: Generated with S6 pileup scenario, which has a mean between 6 and 7 interactions per crossing, and includes pileup from the neighboring bunch crossings according to a Poisson distribution with mean equal to the number of interactions in the in-time crossing [**?**]

- `START42_V14B`: Reconstructed with best alignment and calibration constants and magnetic field conditions as of August 3, 2011

- `Pt_XtoY`: X $\leq$ generated $\hat{p}_T <$ Y

- `BCToE`: Only keeps events if they contain at least one electron with $E_T > 10$ GeV in $|\eta| < 2.5$ that came from a b or c quark

- `doubleEMEnriched`: Enriched in photons, electrons, electrons from b/c decay, and electromagnetic jets [**?**]

- `AODSIM`: Run through full CMS reconstruction algorithm based on a GEANT 4 [**?**] detector simulation; AOD data tier, including generator-level information