



# ATLAS NOTE

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## $E_T^{\text{miss}}$ Studies for the $H \rightarrow W^+W^- \rightarrow \ell\nu\ell\nu$ Search

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## Abstract

In this note a summary of the  $E_T^{\text{miss}}$  studies performed for the  $H \rightarrow W^+W^- \rightarrow \ell\nu\ell\nu$  search is presented. The performance of the  $E_T^{\text{miss}}$  reconstruction with a particular choice of  $\mu$  rescaling is studied. This includes the study of the composition of the  $E_T^{\text{miss}}$  with some emphasis on the muon term. Events passing the final event selection are scanned to search for potential biases. No particular reason for a bias in these events is found. Even though the baseline MC11b MC does not provide an optimal description of the fake  $E_T^{\text{miss}}$  it is believed that the systematic errors considered here are sufficient to cover the mismodeling of the MC in the region of the  $Z$  peak. Two methods have been developed to correct the  $E_T^{\text{miss}}$  showing improved data/MC compatibility. Studies are reported that indicate that no significant  $E_T^{\text{miss}}$  biases are expected to appear in events with low dilepton invariant mass and small azimuthal angle separation where the low mass Higgs boson signal is looked for.

Studies are mostly performed with MC11b. Some checks have been carried out with MC11c, indicating that the treatment of the  $E_T^{\text{miss}}$  systematics is adequate.