

Abstract Submitted  
for the APR11 Meeting of  
The American Physical Society

**General analysis of signals with two leptons and missing energy at the Large Hadron Collider** CHIEN-YI CHEN, Carnegie Mellon University, AYRES FREITAS, University of Pittsburgh — A signal of two leptons and missing energy is challenging to analyze at the Large Hadron Collider (LHC) since it offers only few kinematical handles. This signature generally arises from pair production of heavy charged particles which each decay into a lepton and a weakly interacting stable particle. Here this class of processes is analyzed with minimal model assumptions by considering all possible combinations of spin 0,  $\frac{1}{2}$  or 1, and of weak iso-singlets, -doublets or -triplets for the new particles. Adding to existing work on mass and spin measurements, two new variables for spin determination and an asymmetry for the determination of the couplings of the new particles are introduced. It is shown that these observables allow one to independently determine the spin and the couplings of the new particles, except for a few cases that turn out to be indistinguishable at the LHC. These findings are corroborated by results of an alternative analysis strategy based on an automated likelihood test.

Chien-Yi Chen  
Carnegie Mellon University

Date submitted: 19 Jan 2011

Electronic form version 1.4