

Abstract Submitted  
for the APR12 Meeting of  
The American Physical Society

**Search for the Standard Model Higgs Boson in the  $H \rightarrow WW \rightarrow \ell\nu q'\bar{q}$  Decay Channel** HUONG NGUYEN, University of Virginia, D0 COLLABORATION — A search for the standard model Higgs boson ( $H$ ) is performed using data corresponding to  $9.7 \text{ fb}^{-1}$  of  $p\bar{p}$  collisions at  $\sqrt{s} = 1.96 \text{ TeV}$  collected by the D0 detector at the Fermilab Tevatron collider. We consider final states containing one lepton ( $e$  or  $\mu$ ), missing transverse energy, and exactly two or three jets. Our search is primarily sensitive to the processes  $H \rightarrow W^+W^- \rightarrow \ell\nu q'\bar{q}$ , where the  $H$  is produced by either gluon fusion or weak-boson fusion, and where one  $W$  decays leptonically into a charged lepton plus neutrino and the other  $W$  decays hadronically into a pair of quarks. The search is also sensitive to other Higgs boson channels with different production process, but similar final states such as  $WH \rightarrow \ell\nu b\bar{b}$ . To improve the signal sensitivity, we focus on making optimal use of available kinematic information by dividing the data into orthogonal sub-samples and identifying specific kinematic variables to perform a multivariate analysis for each sample.

Marco Verzocchi  
Fermi National Accelerator Laboratory

Date submitted: 04 Jan 2012

Electronic form version 1.4