SUSY10

Abstracts book

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Search for a low mass standard model Higgs boson in ppbar collisions at $\sqrt{s}=1.96$ TeV

Content:
We present a search for a low mass standard model Higgs boson in proton-antiproton collisions at a center-of mass energy of 1.96 TeV with the D0 detector at the Fermilab Tevatron collider. The search is performed using the associated production of the Higgs boson with a W or a Z boson which decay, resulting in final state with one or two b-tagged jets in association with either two charged leptons, one leptons plus missing transverse energy or just missing transverse energy. We also present a combination of these searches with those exploiting the decay of the Higgs boson in tau pairs and photon pairs. Recent improvements to the sensitivity of these searches, including the extension to the full dataset corresponding to an integrated luminosity of 6.7 fb$^{-1}$, will also be discussed.

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Track classification: Experimental

Contribution type: --not specified--

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Comments:
Please include the head of the D0 speakers bureau ("Horst Wahl" $\&$;wahl@hep.fsu.edu) in any discussion concerning the possible merging of abstracts and talk assignment.
Search for a high mass standard model Higgs boson in ppbar collisions at sqrt(s)=1.96 TeV

Content:
We present a search for a high mass standard model Higgs boson in proton-antiproton collisions at a center-of-mass energy of 1.96 TeV with the D0 detector at the Fermilab Tevatron collider. The search is performed using the H→WW decay, using both final states with two leptons and missing transverse momentum and final states in which one of the two W bosons decays into jets. We also consider decays of the W boson into taus and final states with like-sign dileptons arising from the associated production of the Higgs boson with another vector boson. The results are based on an integrated luminosity of up to 6.7 fb⁻¹. Recent improvements to the sensitivity will also be discussed.

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Abstract ID : 228

Search for neutral supersymmetric Higgs boson in di-tau final states in ppbar collisions at sqrt(s)=1.96 TeV

Content :
We present a search for Higgs bosons in the di-tau modes at a center-of-mass energy of 1.96 TeV using up to 5.4 fb-1 of data collected with the D0 detector at the Fermilab Tevatron collider. In supersymmetric models the Higgs boson production cross section can be significantly enhanced compared to the standard model. In such models, the Higgs boson as a significant branching ratio to tau leptons at all masses, and the gluon fusion production process can be exploited directly. We also consider the bh associated production channel, which provides additional sensitivity close to the Z boson mass. These di-tau channels complement the bh associated production modes through reduced dependence on the details of the supersymmetric model under test.

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Search for neutral supersymmetric Higgs bosons in bbb(b) final states in ppbar collisions at sqrt(s)=1.96 TeV

Content:
We present a search for Higgs bosons in bh(-->bb) and bbh(-->bb) channels at a center-of-mass energy of 1.96 TeV using up to 6.3 fb-1 of data collected with the D0 detector at the Fermilab Tevatron collider. In many supersymmetric models the cross-section for the production of neutral Higgs bosons in association with bottom quarks is greatly enhanced compared to the standard model and over much of the parameter space the dominant decay process is h-->bbar. We search for an excess of events above the multijet background in events with 3 and 4 b-tagged jets. Understanding the multijet background in this channel is particularly challenging. The treatment of the background, the multivariate techniques used to improved the sensitivity and the limit setting procedure are discussed.

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Abstract ID : 230

Searches for W' and for flavor-changing neutral currents in the single top final states with D0

Content:
We present a search for flavor-changing neutral currents in the single top final state using 2.3 fb⁻¹ of lepton plus jets data collected with the D0 experiment. We apply the same event selection as for the single top observation analysis and improve the signal sensitivity using Bayesian Neural Networks. We find consistency between the background expectation and the observed data and set limits on the flavor-changing neutral current couplings of the top quark to the up quark (K_u) and the charm quark (K_c). The same analysis is also used to search for the production of a heavy W' gauge boson that decays to third generation quarks. We analyze the final-state invariant mass distribution and set upper limits on the production cross section times branching fraction. We set lower mass limits for a left-handed W' boson with SM couplings and for right-handed W' bosons decaying to both leptons and quarks and decaying only to quarks. We also set limits on the coupling of the W' boson to fermions as a function of its mass.

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Search for fourth generation t' quarks that decay to Wb with D0

Content:
We present a search for pair-production of a fourth generation t' quark with its antiparticle, followed by their decay to W b, based on 5 fb-1 of data. We set upper limits on the t' pair production cross section which can be translated into limits on the t' mass.

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Measurements of diboson production and of triple gauge couplings in ppbar collisions at \( \sqrt{s}=1.96 \) TeV

Content:
We present measurements of diboson production cross sections in ppbar collisions at the Fermilab Tevatron collider using up to 5.4 fb\(^{-1}\) of data. The cross sections for the \( WW, WZ \) and \( ZZ \) pair production are measured using either the fully leptonic final states or final states in which one of the weak bosons decays into a pair of jets. The total cross section for each process and the kinematic properties of the weak bosons are used to measure or set limits on the triple gauge couplings.

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Measurements of CP violation and searches for rare decays in the $B_0s$ system with the D0 detector

Content:
We present the first evidence for anomalous CP-violation in the mixing of neutral $B$ mesons obtained from the measurement of the charge asymmetry of like-sign dimuon events in 6.1 fb$^{-1}$ of ppbar collisions recorded with the D0 detector at the Fermilab Tevatron collider. We also discuss the search for CP violation in various decay modes of the $B_0s$ system as well as the search for the rare decay $B_0s \rightarrow \mu^+\mu^-$. 

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Searches for dielectron and diphoton resonances with the D0 detector

Content:
The results of searches for dielectron and diphoton resonances with the D0 detector are reported. These searches use 5.4 fb⁻¹ of data from ppbar collisions at a center-of-mass energy of 1.96 TeV, collected by the D0 detector at the Fermilab Tevatron between October 2002 and Summer 2009. We search for resonances in the invariant mass spectrum of two electromagnetic (EM) objects from the decay of new Z' bosons or Randall-Sundrum gravitons to electron-positron and/or photon pairs.

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Searches for physics beyond the standard model in final states with two leptons and jets with the D0 detector

Content :
Using 5.4 fb⁻¹ of data from ppbar collisions at sqrt(s)=1.96 TeV recorded with the D0 detector at the Fermilab Tevatron collider we investigate various models of new physics using final states with two leptons (either pairs of charged leptons, or single lepton final states with missing transverse momentum from neutrinos) and one or two jets. The searches are used to set limits on the production cross section for resonances decaying into WZ pairs, leptoquarks, vector quarks and technicolor models. We also consider, for the first time, cases in which the highly boosted decay products of a weak boson are observed in the detector as a single jet with large mass.

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Searches for physics beyond the standard model in final states with long lived particles.

Content :
Using 5.4 fb^{-1} of data from ppbar collisions at \textit{sqrt(s)}=1.96 TeV recorded with the D0 detector at the Fermilab Tevatron collider we investigate various models of new physics using final states with new long-lived particles. We investigate models in which charged massive long-lived particles are pair produced, as well as models in which a single heavy ionizing state is observed in the detector. Such state could arise as the bound state of pairs of new fermions bound by a new SU(N) "infracolor" gauge coupling (quirks). We also investigate models in which relatively light particles exist in a "potential valley" separated from the standard model by a high potential barrier. This barrier could be crossed leading to the production of hidden valley particles which could decay to standard model particles after moderately short lifetimes. Results from multiple searches for hidden valley particles will be presented.

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Searches for supersymmetry in ppbar collisions at sqrt(s) with the D0 detector

Content :
We present the result of various searches for the production of supersymmetric particles in ppbar collisions at sqrt(s)=1.96 TeV using 5.4 fb-1 of data collected with the D0 detector at the Fermilab Tevatron collider. We search for the pair production of the supersymmetric partner of the bottom quarks in final states with two b-tagged jets and missing transverse momentum, for sneutrinos produced in R-parity violating models using their decays into electron-muon pairs and for final states with two photons and missing transverse momentum which could arise in gravity mediates SUSY breaking scenarios. The latter search is also interpreted inm models with extra dimensions. In all cases the results presented set the most stringent limits on new physics in these models.

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