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Search for the Higgs boson in the H->gamma gamma decays in proton-antiproton collisions at 1.96 TeV

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Recent searches conducted at the Fermilab Tevatron for the Higgs boson in the diphoton decay channel are reported using 7.0/fb and 8.2/fb of data collected at the CDF and D0 experiments respectively. Although the standard model (SM) branching fraction is small, the diphoton final state is appealing due to better diphoton mass resolution compared with dijet final states. In addition, other models — such as fermiophobic models where the Higgs does not couple to fermions — predict much larger branching fractions for the diphoton decay. Here, results are presented for both a SM and fermiophobic Higgs boson as well as a SM search based on a combination of the CDF and D0 analyses.

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