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Multiphoton Production and a Search for Fermiophobic Higgs in $p\bar{p}$ collisions at $\sqrt{s} = 1.96$ TeV OLEKSIY ATRAMENTOV, Iowa State University, DZERO COLLABORATION — A preliminary cross section for the inclusive multiphoton production is presented, as measured by the Run II DØ detector at the Fermilab Tevatron $p\bar{p}$ collider. Photon candidates with transverse momenta greater than 25 GeV/c and within the pseudorapidity of $|\eta| < 3$ are considered. Selection criteria for photon candidates as well as the estimation of background contributions from QCD are presented. Event topologies with up to four photons in the final state which are relevant for fermiophobic Higgs boson searches in two Higgs doublet and triplet models are emphasized. Preliminary limits on the mass of fermiophobic Higgs boson are set.

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