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Studies of Z/γ^* differential cross sections in $p\bar{p}$ collisions with the D0 detector

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We use up to 7.3 fb^{-1} of $p\bar{p}$ collisions collected with the D0 detector study different differential distributions for Z/γ produced in $p\bar{p}$ collisions at the Tevatron collider. In one study we investigate the transverse momentum distribution of the Z/γ boson by using a novel observable that has reduced sensitivity to the effects of experimental resolution and efficiency, allowing detailed investigations of QCD predictions for the dependence of the Z boson transverse momentum on its rapidity. In a second study we investigate the angular distribution of the Z/γ^* decay products as a function of their invariant mass and derive measurements of the electroweak mixing angle and of the Z-light quark couplings.

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