Measurement of the effective weak mixing angle in $p\bar{p} \to Z/\gamma^* \to e^+e^-$ events

—-Supplemental Material—-

The D0 Collaboration

October 13, 2014

In this supplement, we show the $\cos\theta^*$ distributions in the Collins-Soper frame for the CC-CC, CC-EC and EC-EC event categories, and the dielectron invariant mass distributions for the same categories, as well as the ratio of the number of data events to the sum of expected events from signal plus backgrounds.

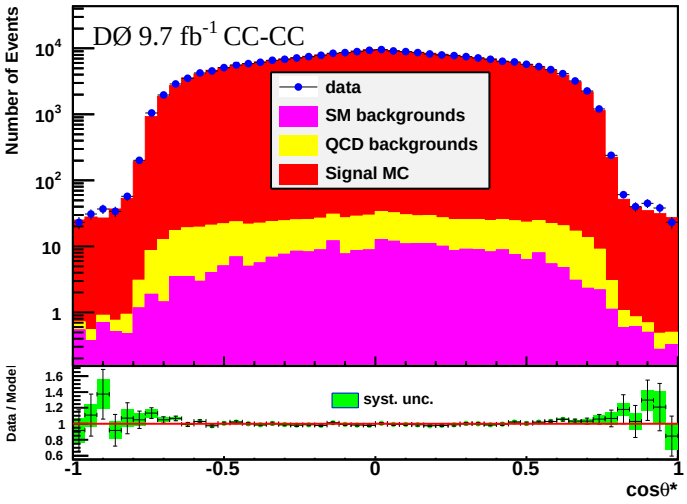

Figure 1: (color online). Comparison between the CC-CC $\cos\theta^*$ distribution in the data to the sum of the QCD and standard model backgrounds and the simulated signal, shown in the invariant mass region $75 < M_{ee} < 115$ GeV. The bottom plot shows N_d/N_s, where N_d and N_s are the number of events in data and the sum of backgrounds and the simulated signal, respectively. The green band is the systematic uncertainty, and the error bar is the total uncertainty.

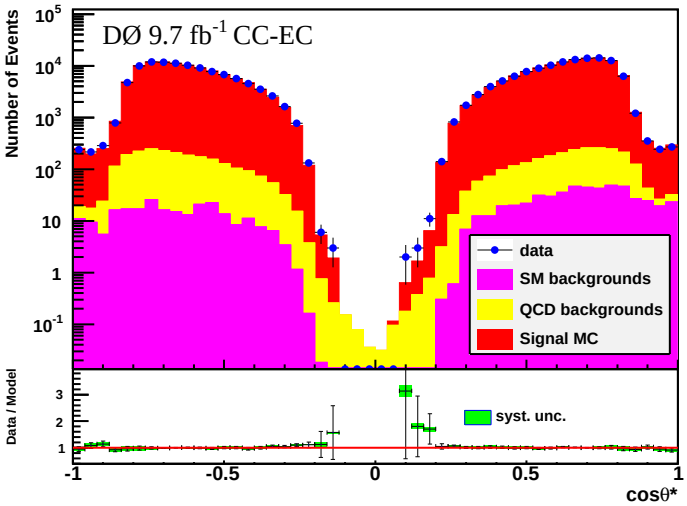

Figure 2: (color online). Comparison between the CC-EC $\cos\theta^*$ distribution in the data to the sum of the QCD and standard model backgrounds and the simulated signal, shown in the invariant mass region $75 < M_{ee} < 115$ GeV. The bottom plot shows N_d/N_s, where N_d and N_s are the number of events in data and the sum of backgrounds and the simulated signal, respectively. The green band is the systematic uncertainty, and the error bar is the total uncertainty.

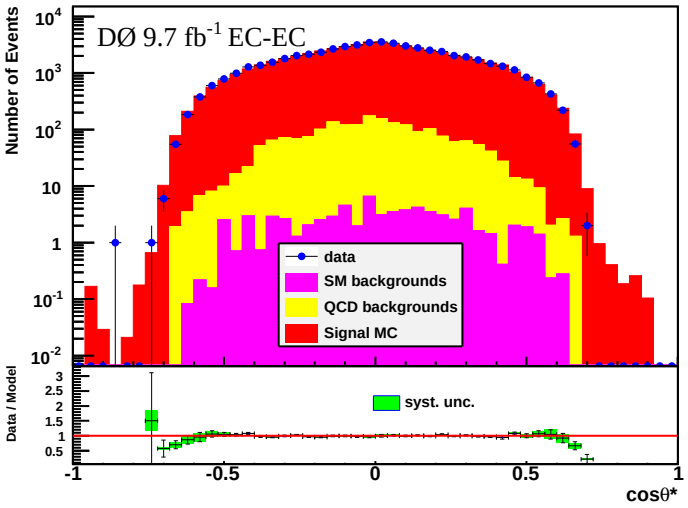

Figure 3: (color online). Comparison between the EC-EC $\cos\theta^*$ distribution in the data to the sum of the QCD and standard model backgrounds and the simulated signal, shown in the invariant mass region $81 < M_{ee} < 97$ GeV. The bottom plot shows N_d/N_s, where N_d and N_s are the number of events in data and the sum of backgrounds and the simulated signal, respectively. The green band is the systematic uncertainty, and the error bar is the total uncertainty.

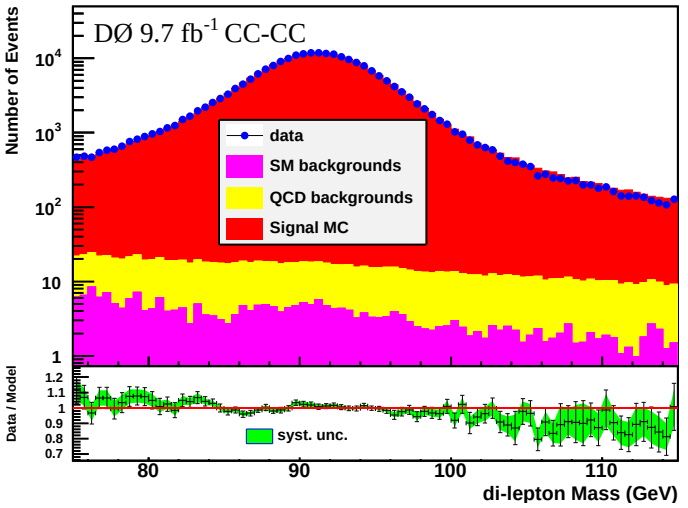

Figure 4: (color online). Comparison between the CC-CC di-lepton invariant mass distribution in the data to the sum of the QCD and standard model backgrounds and the simulated signal. The bottom plot shows N_d/N_s, where N_d and N_s are the number of events in data and the sum of backgrounds and the simulated signal, respectively. The green band is the systematic uncertainty, and the error bar is the total uncertainty.

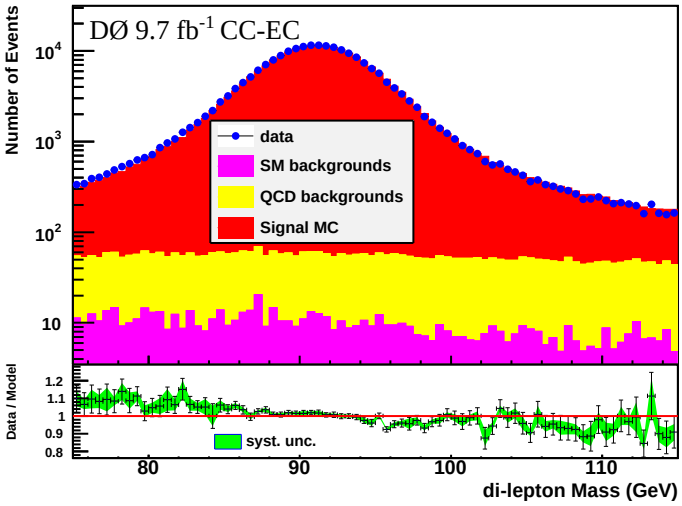

Figure 5: (color online). Comparison between the CC-EC di-lepton invariant mass distribution in the data to the sum of the QCD and standard model backgrounds and the simulated signal. The bottom plot shows N_d/N_s, where N_d and N_s are the number of events in data and the sum of backgrounds and the simulated signal, respectively. The green band is the systematic uncertainty, and the error bar is the total uncertainty.

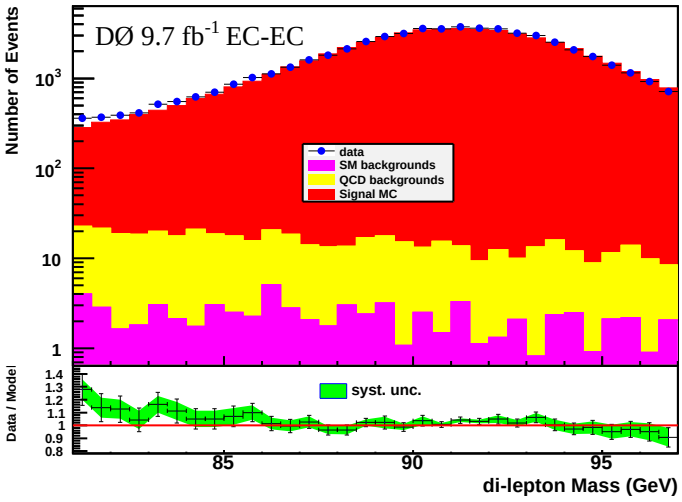

Figure 6: (color online). Comparison between the EC-EC di-lepton invariant mass distribution in the data to the sum of the QCD and standard model backgrounds and the simulated signal. The bottom plot shows N_d/N_s, where N_d and N_s are the number of events in data and the sum of backgrounds and the simulated signal, respectively. The green band is the systematic uncertainty, and the error bar is the total uncertainty.