Measurement of inclusive η, ρ^0, $\mathbf{f_0(980)}$ and $\mathbf{f_2(1270)}$ Photoproduction at HERA

H1 Collaboration

Abstract

H1 results are presented on the inclusive photoproduction of the neutral mesons η, ρ^0, $f_0(980)$ and $f_2(1270)$ at an average γp collision energy $W = 210\ GeV$. The measurement is based on about 4×10^6 multihadronic events collected in the year 2000, corresponding to an integrated luminosity of 38.7 pb^{-1}.

Preliminary results prepared for the DIS2003 workshop, St Petersburg

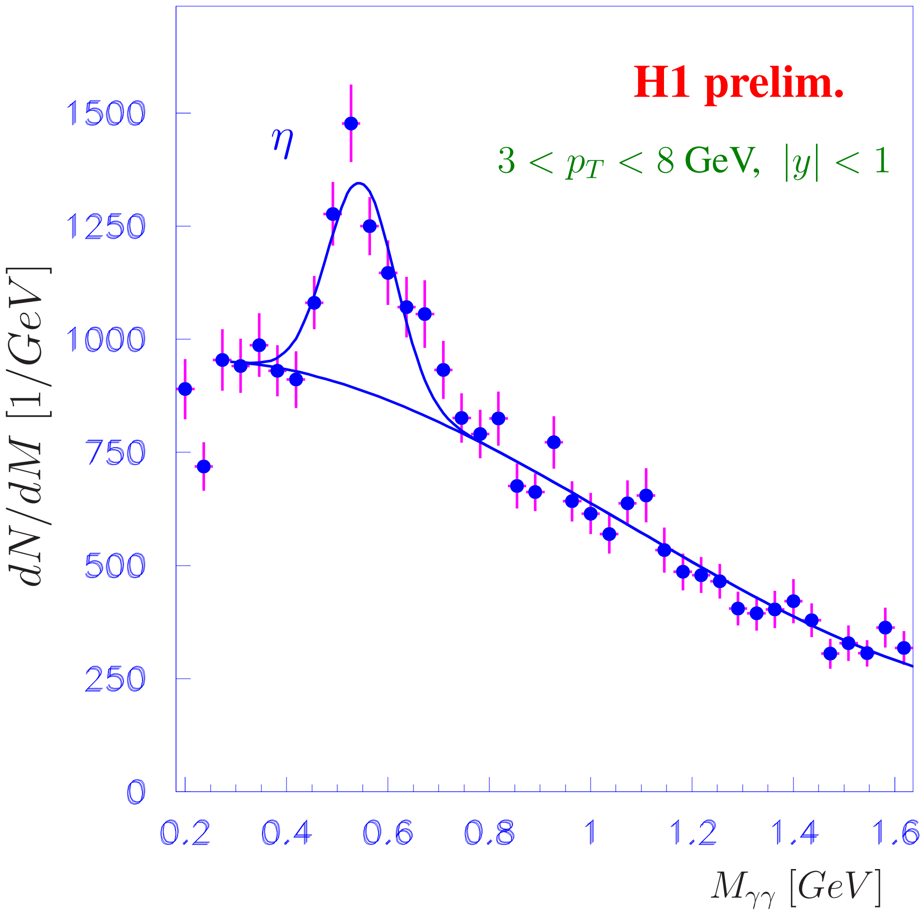

Figure 1: Two-photon mass spectrum after the analysis cuts. The smooth curve represents the result of a fit to a sum of a Gaussian and a third order polynomial.

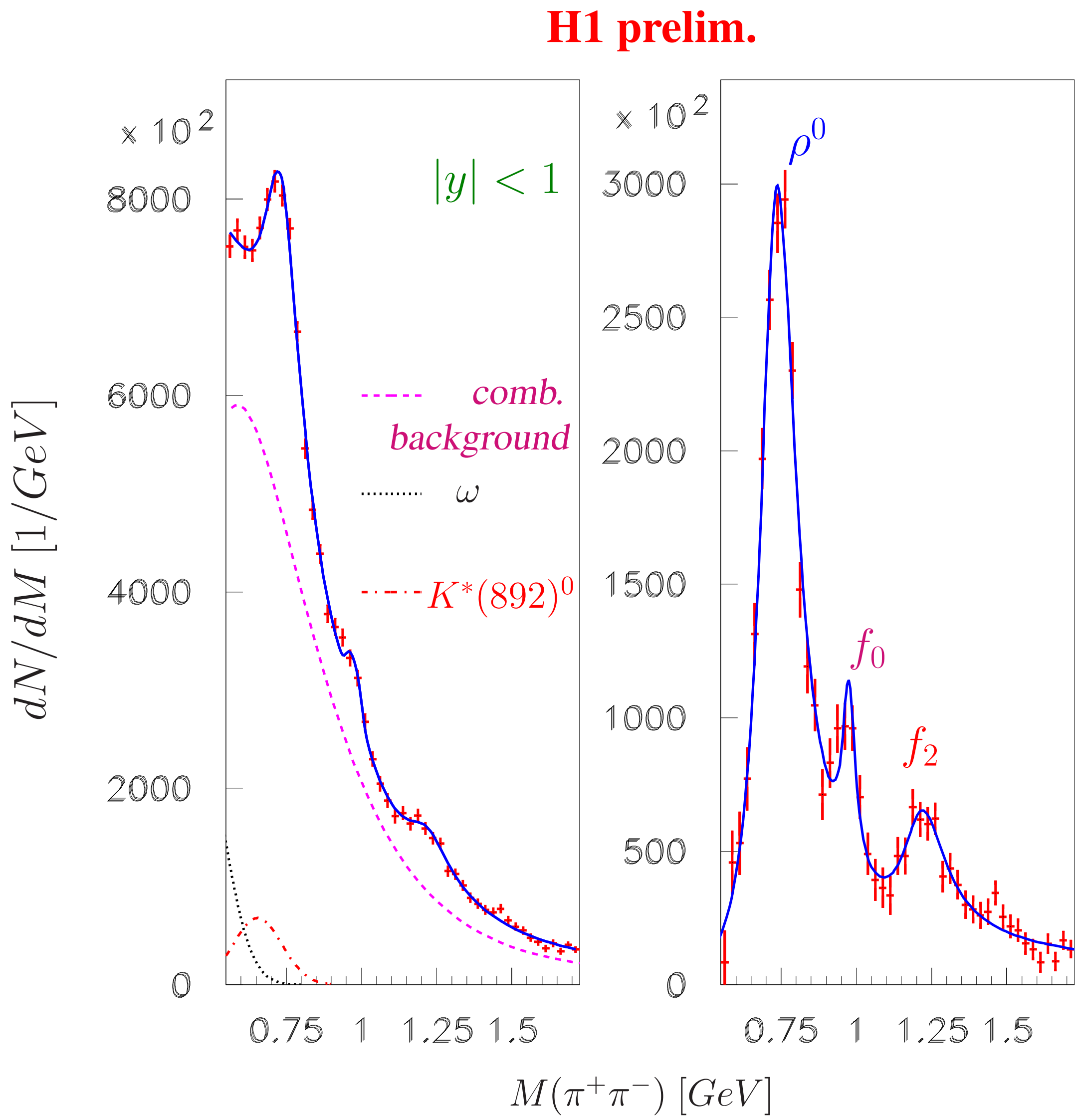

Figure 2: The $\pi^+\pi^-$ invariant mass spectrum after subtraction of background using the measured like-sign spectrum. The full curves show the result of a fit including the ρ, f_0 and f_2 resonances. In the left plot the dashed curve corresponds to the contribution of residual non-resonant background, the dotted and dash-dotted curves describe the contributions from ω and K^* reflections, respectively. In the right plot the points represent the data after subtraction of the background and the reflections.

H1 prelim.

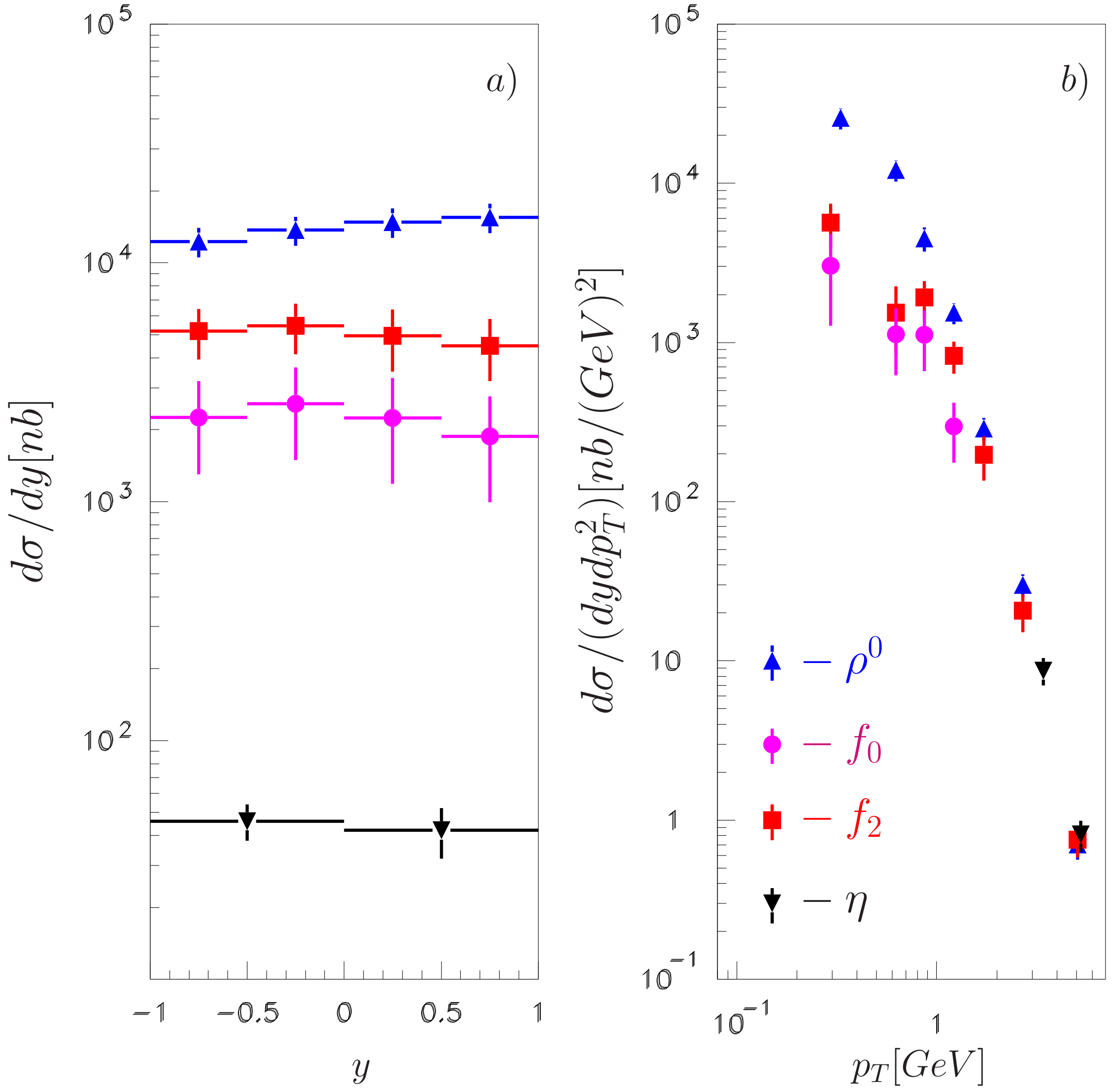

Figure 3: The differential cross sections for the inclusive photoproduction of η (filled down-pointing triangles), ρ^0 (filled uppointing triangles), $f_0(980)$ (filled circles) and $f_2(1270)$ (filled squares) mesons. (a) Cross sections as a function of laboratory rapidity, y, for meson transverse momentum $p_T > 0$ GeV (ρ^0, f_0 and f_2 mesons) and $3 < pt < 8$ GeV (η meson). (b) Cross sections as a function of p_T for $y = 0$.

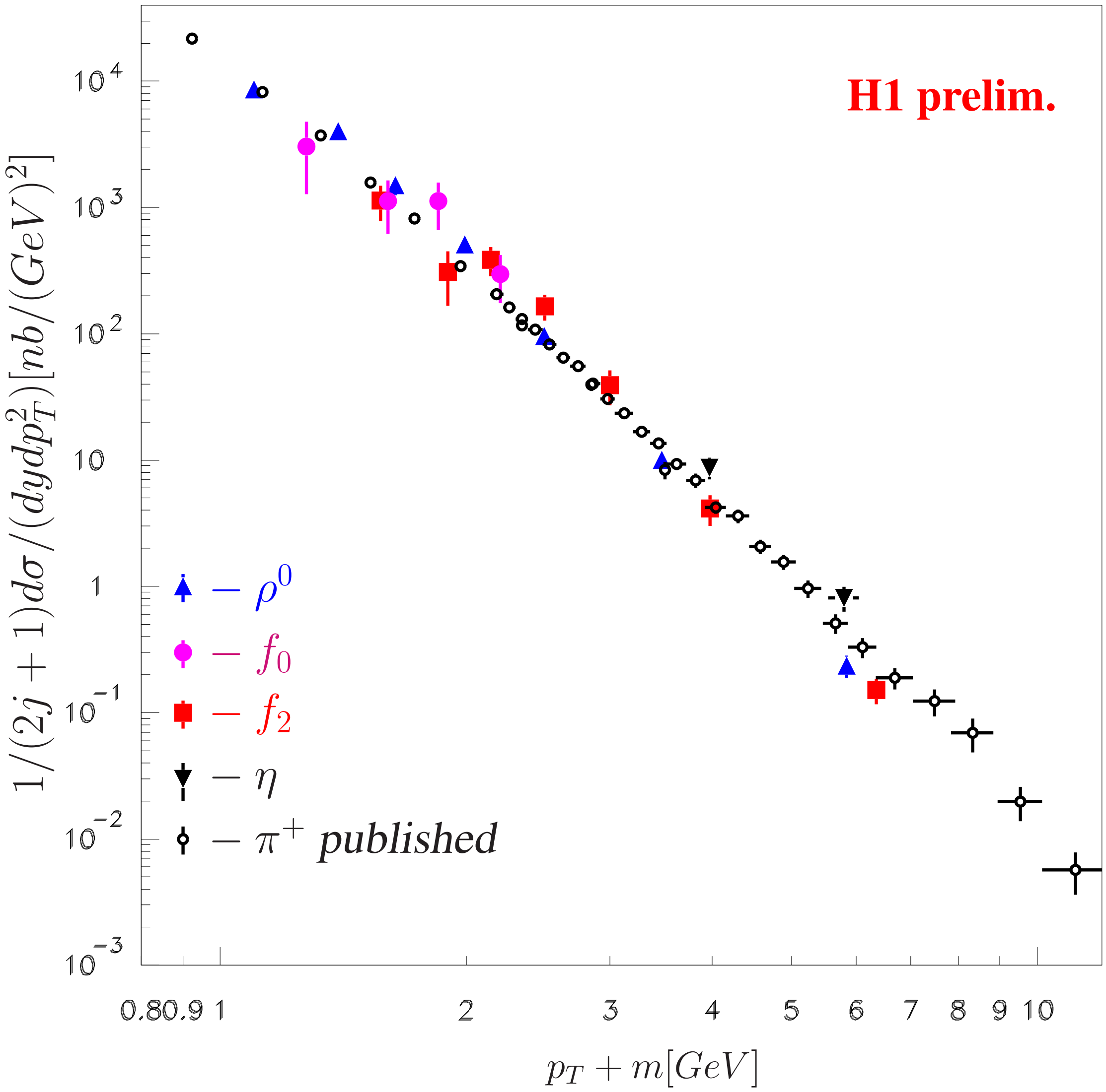

Figure 4: The differential cross sections for η (filled downpointing triangles), ρ^0 (filled up-pointing triangles), $f_0(980)$ (filled circles) and $f_2(1270)$ (filled squares) plotted as function of $(m + p_T)$, with m being the nominal meson mass. The open symbols show the π production cross section calculated from measurement of the charged particle spectrum in photoproduction.