Diffractive Group Meeting DESY

26 January 2000

Vector-Meson Production at High $|t|$

A Recently Proposed Model

- *A New Anomalous Trajectory in Regge Theory*
  N.I.Kochelev et al. (hep-ph/9911480)

- *Anomalous f_1 Exchange in Vector-Meson Photoproduction Asymmetries*
  Y.Oh et al. (hep-ph/0001209)

- *Spin-dependent Structure Functions of Sea Quarks in Non-perturbative QCD ...*
  A.E.Dorokhov and N.I.Kochelev
  (Phys. Lett. B259 (1991) 335

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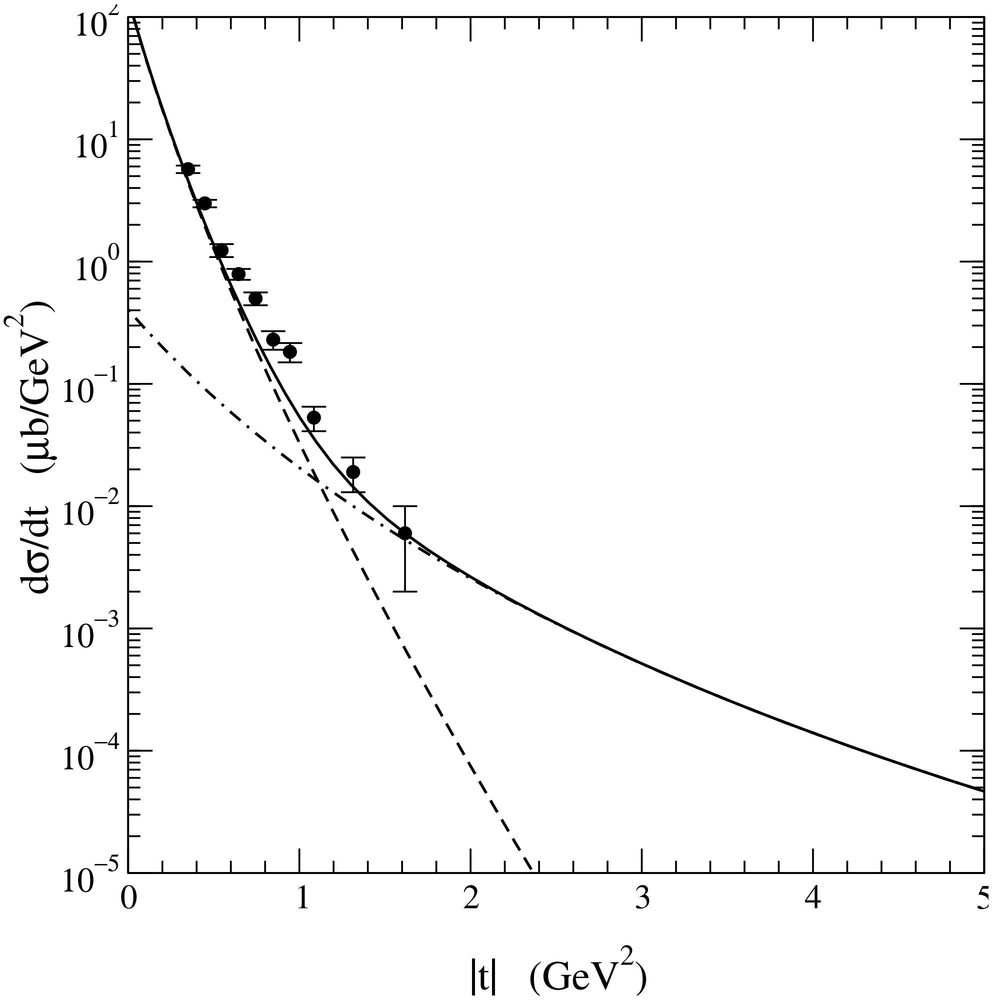
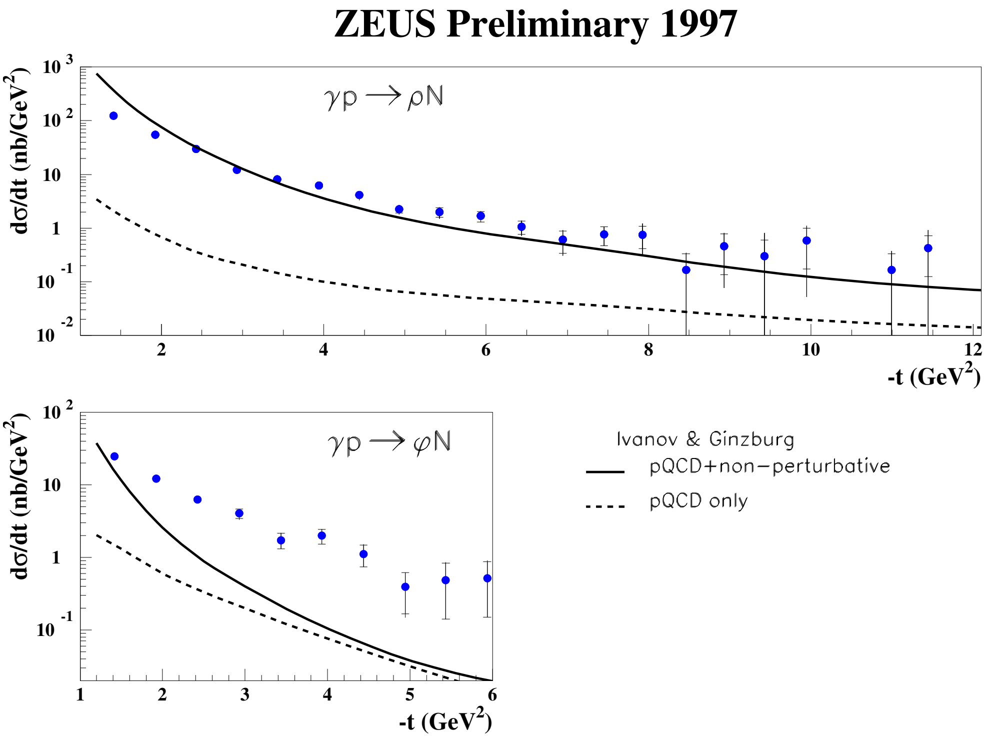
Differential Cross Section



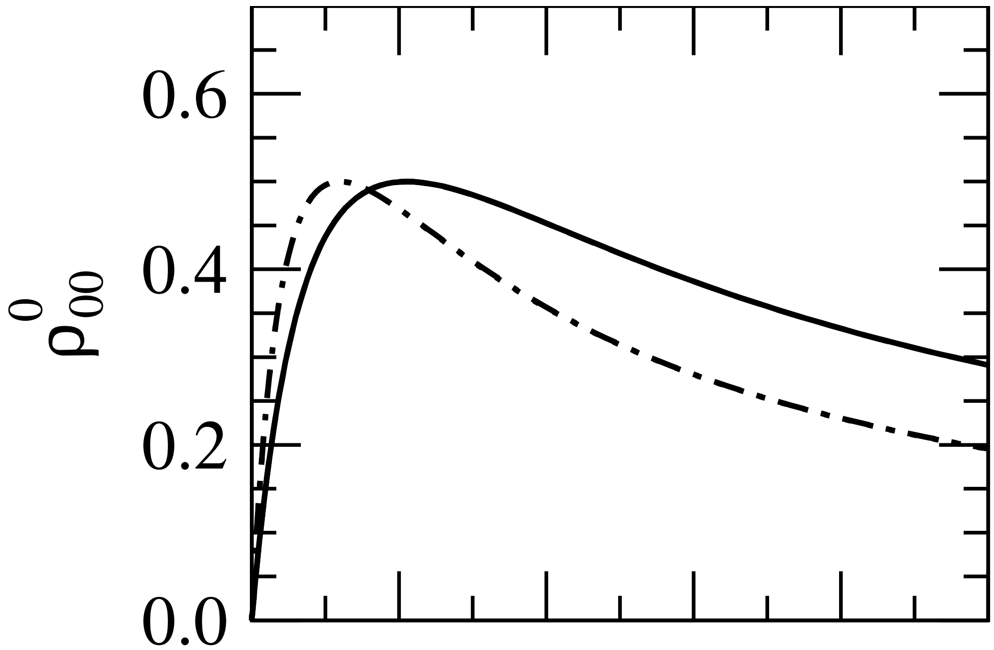
f_1 exchange gives a very hard spectrum

Differential Cross Section
ZEUS EPS Paper 499 (1997 data)



Is the high-statistics data consistent with Kochelev et al.?

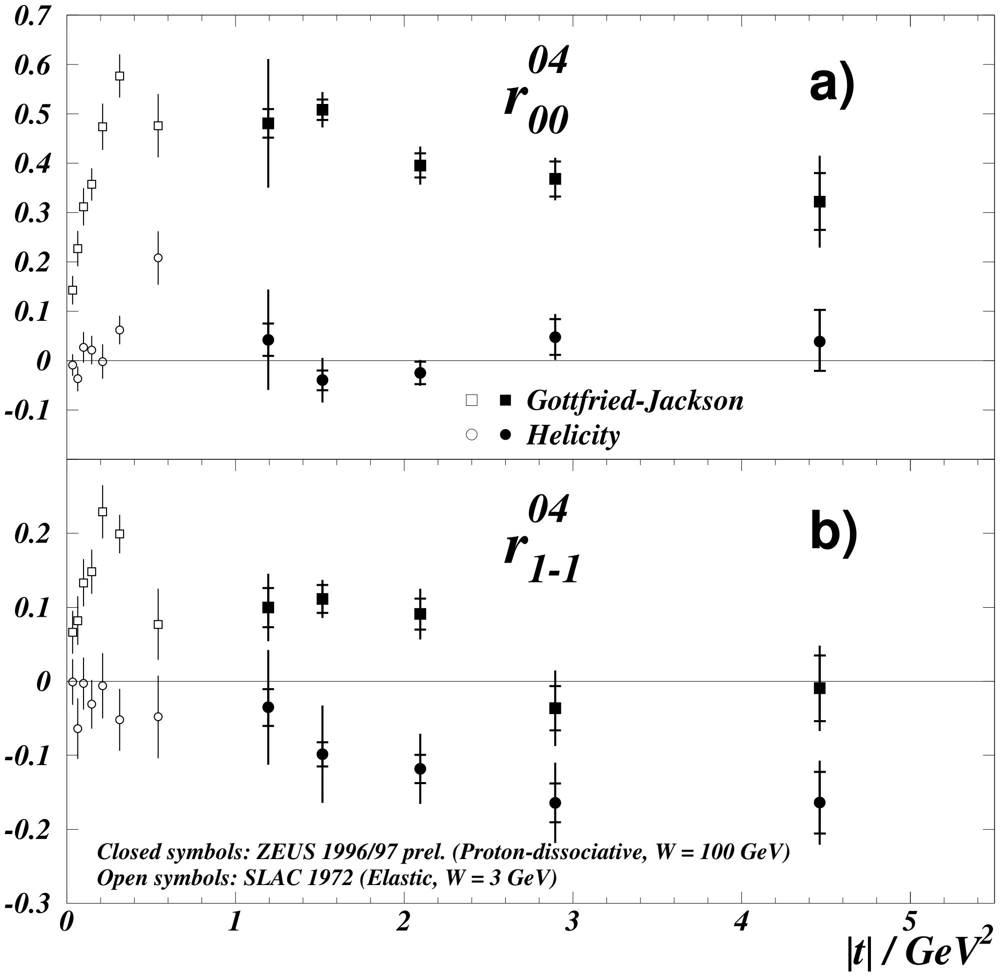
Spin-Density Matrix Elements



These predictions are made in the Gottfried-Jackson frame.

Our 1997 results in the GJ frame appear in EPS Paper 499.

Spin-Density Matrix Elements
ZEUS EPS Paper 499



Observed dependence of ρ^0_{00} on $|t|$ is steeper than predicted

Some interesting remarks

(paraphrased from the 3 papers)

- It seems plausible that the Pomeron is related to the conformal anomaly of QCD. We strongly suspect the new trajectory to be related to the axial anomaly of the theory.

- We think that the residue of trajectory associated with the Adler-Bell-Jackiw axial anomaly will behave has a nucleon singlet axial-vector form factor. It is known that this form factor decreases with $|t|$ much more slowly than the electromagnetic one.

- Similar information can also be obtained from vector-meson *electroproduction*. Since f_1 exchange dominates at high $|t|$, it is necessary to measure the $|t|$ dependence of the density matrices for $|t| \gtrsim 2$ GeV^2.