

EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH

POLARIZATION IN pp ELASTIC SCATTERING AT 150 GeV/c

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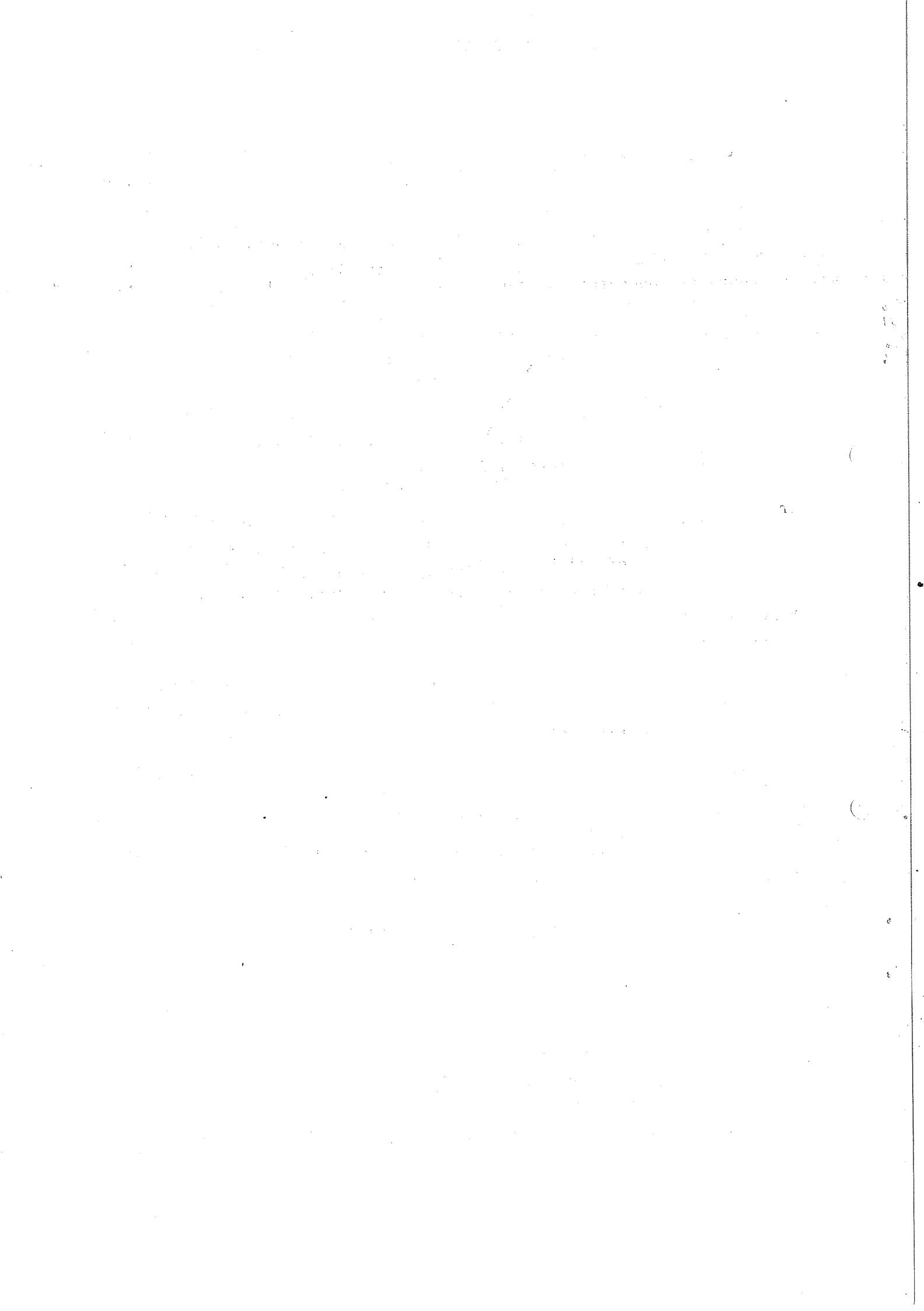
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We report results from a first analysis of data taken at the CERN SPS. The aim of the experiment is to arrive at a better understanding of the role played by spin in high energy hadron-hadron interactions by measuring in the 50 - 150 GeV/c range two-body reactions induced by protons and pions on polarized protons, for which either the target baryon or the beam particle are left with a laboratory momentum between 0.5 and 2 GeV/c ( $0.3 \leq -t \leq 3$  GeV $^2$  for elastic p-p). The dip observed in the cross-section for elastic proton-proton scattering at the ISR energies is located in this region.

The experimental apparatus (Fig. 1) consisting of MWPC and scintillation counter hodoscopes is built around a 1 m diameter magnet at the center of which a polarized proton target (15 cm long and 22 mm diameter) is located. A backward telescope allows the measurement of the low energy particle over a large polar angle. The momentum is obtained by correlating the tracks inside and outside the magnetic field. The time of flight is also measured, to allow a mass determination. The apparatus is completed by a forward arm which makes use of two 2 m bending magnets and a Čerenkov counter; the acceptance is overmatched to the backward arm.

We had run for ~250 hours in the H3 beam, tuned on 150 GeV/c positive particles ( $5 - 10 \cdot 10^6$  particles per pulse, mostly protons with ~1% pion contamination); the target polarization has been ~87%.

We have measured the t-dependence of the proton-proton elastic cross-section ( $0.3 \leq -t \leq 2.7$  GeV $^2$ ), which is shown in Fig. 2, together with an eyeball fit of Fermilab data at 100 and 200 GeV/c \*). From a preliminary analysis of the up-down asymmetry we have also obtained polarization data up to  $t \leq -1$  GeV $^2$ , which are compared in Fig. 3 with the 45 GeV/c data \*\*).

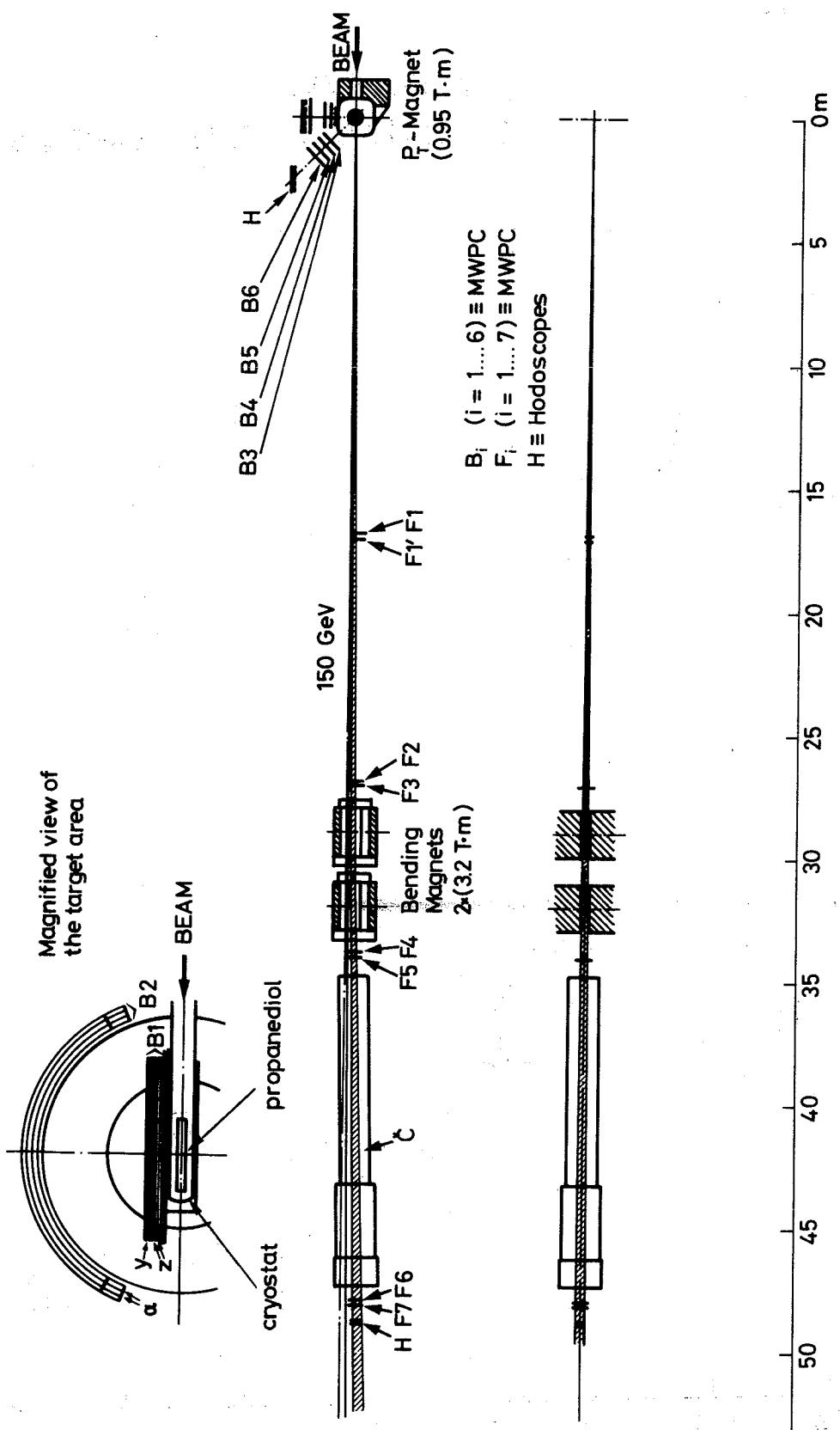
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\*) C.W. Akerlof et al, Phys. Letts. 59B, 197 (1975)

\*\*) A. Gaidot et al, Phys. Letts. 61B, 103 (1976)

p-p elastic scattering at 150 GeV/c

Differential cross-section		
$-t$ (GeV $^2$ )	$d\sigma/dt$	
0.48	530	$\pm 5 \text{ nb GeV}^{-2}$
0.60	236	$\pm 3$
0.73	55	$\pm 2$
0.88	9.7	$\pm 0.6$
1.08	1.7	$\pm 0.2$
1.28	348	$\pm 68 \text{ nb GeV}^{-2}$
1.50	148	$\pm 38$
1.74	98	$\pm 33$
1.98	81	$\pm 29$
2.26	37.5	$\pm 18$
2.54	35.5	$\pm 17$
Polarization parameter		
$-t$	P	
0.29	0.016	$\pm 0.039$
0.40	-0.010	$\pm 0.022$
0.53	-0.012	$\pm 0.012$
0.66	-0.015	$\pm 0.016$
0.83	-0.043	$\pm 0.033$
0.98	-0.101	$\pm 0.082$



Experiment WA6: Polarization in pp and  $\pi p$  Elastic Scattering

Fig. 1

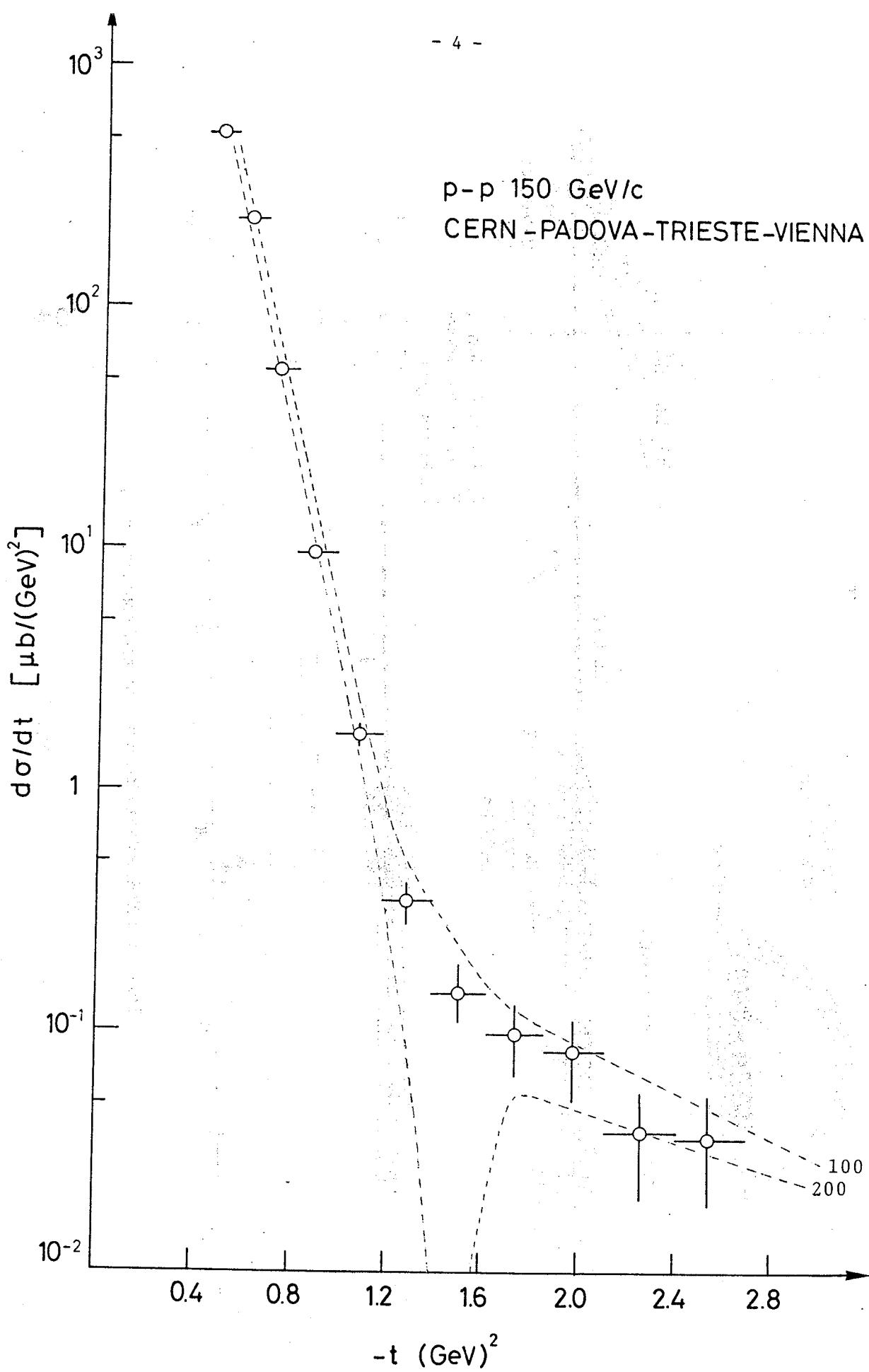


Fig. 2

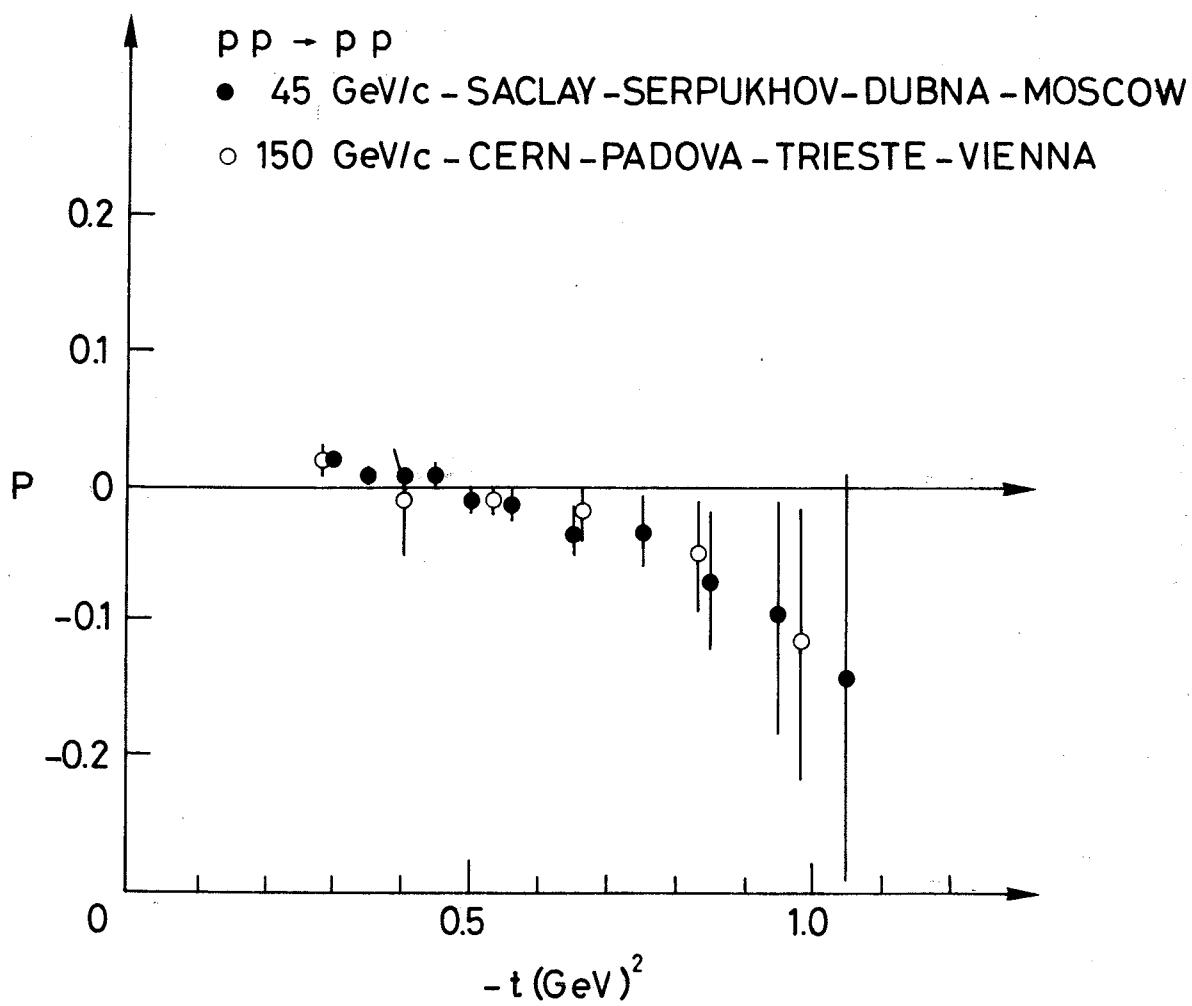


Fig. 3

100% of the patients had a history of smoking.

The mean age was 51 years (range 21-79).

The mean serum creatinine was 1.4 mg/dl (range 0.6-2.8).

The mean serum albumin was 3.5 g/dl (range 2.5-4.5).

The mean serum total protein was 6.5 g/dl (range 5.0-8.0).

The mean serum cholesterol was 210 mg/dl (range 140-300).

The mean serum triglycerides were 150 mg/dl (range 100-250).

The mean serum uric acid was 5.5 mg/dl (range 3.0-8.0).

The mean serum glucose was 110 mg/dl (range 80-140).

The mean serum bilirubin was 1.0 mg/dl (range 0.5-2.0).

The mean serum alkaline phosphatase was 100 U/l (range 40-250).

The mean serum gamma glutamyl transpeptidase was 100 U/l (range 40-250).

The mean serum lactate dehydrogenase was 150 U/l (range 100-250).

The mean serum aspartate aminotransferase was 40 U/l (range 10-100).

The mean serum alanine aminotransferase was 30 U/l (range 10-100).

The mean serum gamma globulin was 1.5 g/dl (range 0.5-2.5).

The mean serum IgG was 1.2 g/dl (range 0.5-2.0).

The mean serum IgA was 0.4 g/dl (range 0.2-1.0).

The mean serum IgM was 0.2 g/dl (range 0.1-0.5).

The mean serum IgD was 0.05 g/dl (range 0.01-0.1).

The mean serum IgE was 100 U/ml (range 10-1000).

The mean serum IgB was 0.05 g/dl (range 0.01-0.1).

The mean serum IgN was 0.05 g/dl (range 0.01-0.1).

The mean serum IgP was 0.05 g/dl (range 0.01-0.1).

The mean serum IgS was 0.05 g/dl (range 0.01-0.1).

The mean serum IgW was 0.05 g/dl (range 0.01-0.1).

The mean serum IgX was 0.05 g/dl (range 0.01-0.1).

The mean serum IgY was 0.05 g/dl (range 0.01-0.1).