Proc. Sixth Int. Symp. Polar. Phenom. in Nucl. Phys., Osaka, 1985
J. Phys. Soc. Jpn. 55 (1986) Suppl. p. 822-823

3.10

Measurement of the Analyzing Power A_{oono} for p-p Elastic Scattering in the Energy Range from 0.83 to 1.1 GeV

J. Bystricky, P. Chaumette, J. Deregel, J. Fabre, F. Lehar,
A. de Lesquen, F. Petit, L. van Rossum
DPhPE, CEN-Saclay, France

J.M. Fontaine, F. Perrot
DPhN/ME, CEN-Saclay, France

J. Ball
LNS, CEN-Saclay, France

Y. Onel
DPNC, University of Geneva, Switzerland

A. Penzo
INFN, Trieste, Italy

A. Michalowicz
LAPP, Annecy, France

We present new results for the pp analyzing power A_{oono} at θ_{CM} from 46° to 90° for five energies between 0.83 and 1.1 GeV, obtained during the measurements of the spin correlation parameter A_{oonn} at SATURNE II (see contribution to this conference-ref.[1]). The beam, target and detectors are described in [1].

In the analysis we have assumed the equality of the beam and target analyzing powers A_{oono} and A_{ooon} as required by the Pauli principle. The angular distributions are shown in Figs 1a-e. The figures show most of existing data [2-8] and the phase shift analysis predictions [9,10].

Our data in this angular range show a progressive change of the shape of the angular distribution $A_{oono} = f(\theta_{CM})$ characterized by a considerable change of the slope when approaching $\theta_{CM} = 90°$. This effect was already observed in one of the first polarized target experiment at SATURNE I (see fig.3 of ref.[2]). We note that at our highest energy we are just reaching the value where a four-momentum transfer of $-t = 1$ $(GeV/c)^2$ becomes possible in p-p elastic scattering (at $\theta_{CM} = 90°$). On the other hand it is well known that in the region of 3 to 20 GeV one observes a dip [11,12] in the analyzing power which at even higher energies develops at 1 $(GeV/c)^2$ into a structure with negative analyzing power.

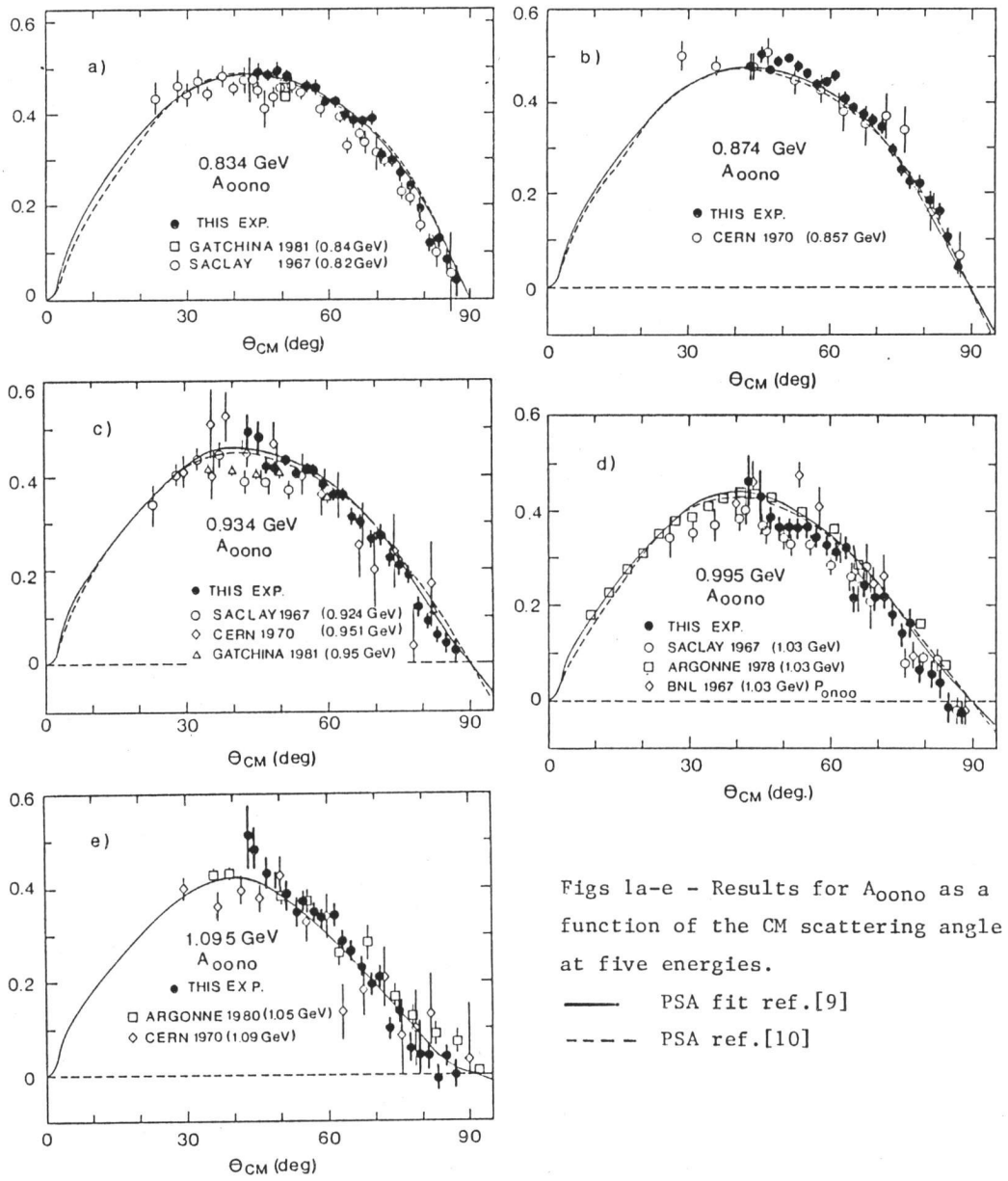
It is also well known that in the vicinity of $-t = 1$ $(GeV/c)^2$ the unpolarized p-p elastic differential cross section shows a shoulder or a dip up to the highest energies.

Comparison with the previously published representative results [2-8] shown in Figures 1a-e shows good general agreement. At most of energies, especially at 0.874 and 0.934 GeV, our data essentially increase the presision.

Comparison of the analyzing power A_{oono} measured in this experiment with the recoil proton polarization P_{onoo} [7] at 0.995 GeV shows no significant difference between these two parameters within the present errors of the order of 10%.

References

1) J.Bystricky et al., Contribution to this Conference : Measurement of the Spin Correlation Parameter A_{oonn} for p-p Elastic Scattering in the Energy Range from 0.83 to 1.1 GeV
2) G. Cozzika et al., Phys.Rev. 164 (1967) 1672
3) N.S. Borisov et al., Soviet Phys. JETP 54 (1981) 841
4) N.S. Borisov et al., JETP Lett. 34 (1981) 130
5) M.B. Albrow et al., Nucl.Phys. B23 (1970) 445
6) M.L. Marshak et al., Phys.Rev. C18 (1978) 331
7) H.A. Neal and M.J. Longo, Phys.Rev. 161 (1967) 1374
8) D.A. Bell et al., Phys.Lett. 94B (1980) 310
9) J. Bystricky, C. Lechanoine-LeLuc and F. Lehar, Preprint DPhPE 82-12, revised February 1984, Saclay 1984
10) R.A.Arndt et al., Phys.Rev. D28 (1983) 97
11) J. Deregel et al., Nucl.Phys. B103 (1976) 269
12) M. Borghini et al., Phys.Lett. 36B (1971) 501



Figs 1a-e - Results for A_{oono} as a function of the CM scattering angle at five energies.

——— PSA fit ref.[9]

- - - - PSA ref.[10]