Proc. Sixth Int. Symp. Polar. Phenom. in Nucl. Phys., Osaka, 1985 J. Phys. Soc. Jpn. 55 (1986) Suppl. p. 816-817

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Analysing Powers in Free np Forward Elastic Scattering at Energies from 650 to 1000 MeV

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The measurement of analysing powers in free np elastic scattering has been performed at the synchrotron SATURNE at Saclay. Such measurements are of interest for two main reasons. First, they provide data for phase-shift analysis (study of N-N interactions, dibaryonic states...). Second, the np elementary amplitude is a necessary ingredient of any microscopic description of nucleon-nucleus reaction mechanism.

A polarized neutron was obtained by break-up of a vector polarized deuteron beam on a Be target. Incident neutron energies were 633, 784, 834, 934, 985 MeV. The polarization of the beam was  $0.58 \pm 0.01$ . The recoil proton from np elastic scattering was detected and its energy and angle measured in an ionization chamber, IKAR<sup>1</sup>, filled with methane (CH<sub>4</sub>) which served as both reaction target and ionizing medium. The forward angle scattered neutron was detected in coincidence in one of two sets of large plastic scintillators, with about 70 % efficiency. The experimental set-up is shown in Fig. 1.





Measured angular distribution are shown in Fig. 2, together with previously existing results, most of which were obtained in quasi-elastic scattering measurements of the p + d system. When comparison is possible, our values seem in good agreement with others. Our measurements, however, are the only ones in the small transfer region.



Fig. 2. The  $\vec{n}p$  clastic analysing power data measured in this experiment (  $\blacklozenge$  our points) compared to previous experimental data for  $\vec{n}p$  clastic scattering (  $\diamondsuit$  625 MeV,  $\blacklozenge$  675 MeV,  $\diamondsuit$  775 MeV,  $\blacktriangle$  665 MeV) and  $\vec{p}n$  quasi-clastic scattering ( △ 635 MeV, x 635 MeV,  $\Box$  800 MeV,  $\bigcirc$  800 MeV,  $\nabla$  1030 MeV).

## Références

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