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Measurement of the analyzing powers in pd elastic and pn quasi-elastic scattering at small angles

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The analyzing powers in proton-deuteron elastic and proton-neutron quasi-elastic scattering were measured at small angles using a polarized proton beam at the COSY storage ring incident on an unpolarized deuterium target. Data were taken at 796 MeV and five energies from 1600 MeV to 2400 MeV. The analyzing power in pd elastic scattering was studied by detecting the low energy recoil deuteron in telescopes placed symmetrically in the COSY plane to the left and right of the beam whereas for pn quasi-elastic scattering a low energy proton was registered in one of the telescopes in coincidence with a fast scattered proton measured in the ANKE magnetic spectrometer. Though the experiment explores new domains, the results are consistent with the limited published information. The ratio of the deuteron to proton analyzing power in pd elastic scattering is broadly consistent with the predictions of an extended Glauber model.

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