



High Energy Physics - Phenomenology

Spin-dependent part of $\bar{p}d$ interaction cross section and Nijmegen potential

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Low energy $\bar{p}d$ interaction is considered taking into account the polarization of both particles. The corresponding cross sections are obtained using the Nijmegen nucleon-antinucleon optical potential with shadowing effects taken into account. Double-scattering effects are calculated within the Glauber approach and found to be about 10-20%. The cross sections are applied to the analysis of the polarization buildup which is due to the interaction of stored antiprotons with a polarized target. It is shown that, at realistic parameters of a storage ring and a target, the filtering mechanism may provide a noticeable polarization in a time comparable with the beam lifetime. The energy dependence of the polarization rate for deuterium target is similar to that for hydrogen one. However, the time of polarization for deuterium is much smaller than that for hydrogen.

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