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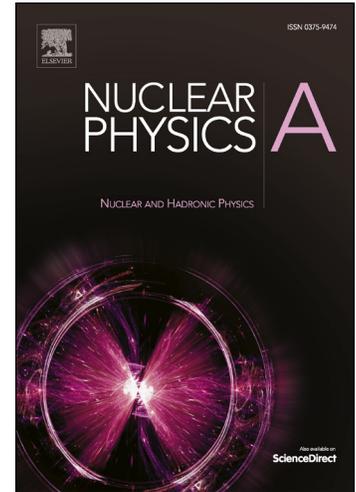
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Elastic scattering, polarization and absorption of relativistic antiprotons on nuclei

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Abstract

We perform Glauber model calculations of the antiproton-nucleus elastic and quasielastic scattering and absorption in the beam momentum range $\sim 0.5 \div 10$ GeV/c. A good agreement of our calculations with available LEAR data and with earlier Glauber model studies of the $\bar{p}A$ elastic scattering allows us to make predictions at the beam momenta of ~ 10 GeV/c, i.e at the regime of the PANDA experiment at FAIR. The comparison with the proton-nucleus elastic scattering cross sections shows that the diffractive minima are much deeper in the $\bar{p}A$ case due to smaller absolute value of the ratio of the real-to-imaginary part of the elementary elastic amplitude. Significant polarization signal for $\bar{p}A$ elastic scattering at 10 GeV/c is expected. We have also revealed a strong dependence of the $\bar{p}A$ absorption cross section on the slope parameter of the transverse momentum dependence of the elementary $\bar{p}N$ amplitude. The $\bar{p}A$ optical potential is discussed.

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