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Large parity non-conservation in resonance interaction of polarized nucleons with nuclei

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The present work has shown that the large P-odd effects (an order of 10%) in the interaction of polarized nucleons with nuclei has the clear - cut resonance behaviour previously predicted in ¹⁾. The considered processes occur through the high excited resonant states of compound nuclei. Resonance mechanism of P-odd effects unique defines their energy dependence as well as dependence on nuclear characteristics ²⁾. Large P-odd effects are explainable in the frame of the presently used ideas of the weak interaction of nucleons, and there is no need to introduce any new parity - violating forces (as in ref.³⁾).

Recently experimental results on the effects (an order of 10%) of the parity non-conservation in the interaction of resonant neutrons and protons with nuclei was obtained. P-odd asymmetries into inelastic scattering cross sections of longitudinally polarized neutrons by the nuclei ⁸¹Br, ¹¹⁷Sn and ¹³⁹La ⁴⁾ and in the differential cross section of the reaction ¹⁹F($\vec{p}$, α)¹⁶O for longitudinally polarized protons ⁵⁾ were studied. The investigations of resonance P-odd effects give important information about the nuclear structure as well as the structure of weak interaction of nucleons in nuclei.

References

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