

Hadronic parity violation in $\gamma d \rightarrow \vec{n}p$ at low energies

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Hadronic parity violation is studied in the photo-disintegration of the deuteron at low energies. We calculate the parity-violating spin asymmetries $P_{x'}$ and $P_{z'}$ with the polarized outgoing neutrons. Non-vanishing asymmetry arises from the interference of opposite parity states in the initial and final state wave functions. Parity admixtures are accounted by using a pionless effective field theory with dibaryon fields. The results are obtained in terms of the unknown low-energy constants at the parity-violating dibaryon-nucleon-nucleon vertices. We find that the magnitude of the observables, aside from the low-energy constants, is of the similar order to the parity-violating polarization in $np \rightarrow d\gamma$ at thermal energies. We discuss the implication of the results to our understanding of the hadronic parity-violating interactions.

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