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Three-nucleon systems and three-nucleon interactions

The nuclear interaction problem can nowadays be addressed within the systematic framework of effective field theories, rooted in the underlying quantum chromodynamics through its approximate and dynamically broken chiral symmetry. Nevertheless, despite tremendous progress, long-standing discrepancies between theory and experiment persist in the A=3 continuum, most notably the so-called Ay puzzle, due to the poorly known three-nucleon force. We will review its status and the perspectives to solve it using the freedom to parametrize the off-shell nucleon-nucleon contact interaction arising at the fourth order of the low-energy expansion.

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