

Time-Reversal Invariance Violation in nuclear reactions with neutrons

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Time Reversal Invariance Violating (TRIV) effects in neutron transmission through a nuclei target are discussed. We explore the possibility to search TRI violation using important advantages of neutron nuclei interactions: the enhancement of TRIV observables by many orders of magnitude, the measurements of relative effects (TRIV and parity violating ones at the same resonances) with a cancelation of strong interaction contributions, and the availability of a large number of the nuclear targets, which provides the assurance of avoiding possible “accidental” cancelations of TRIV effects due to unknown structural factors related to the strong interactions. The absence of final state interactions for the set of specific observables makes these neutron experiments very complementary to electric dipole moment (EDM) measurements. Therefore, the expected results in neutron scattering at new high flux Spallation Neutron can essentially improve the current limits on the TRIV interactions.

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