

Abstract

We propose a single arm $d(e,e')$ threshold electrodisintegration experiment at electron energies up to 1.6 GeV in Hall A. The isovector magnetic dipole transition from the ground state to the nearly bound 1S_0 state dominates the cross section at threshold so that the process is sensitive to meson exchange currents in the nucleon-nucleon interaction. This experiment will extend the data up to the highest possible momentum transfer, limited by a cross section of $9 \cdot 10^{-42} \text{ cm}^2/\text{sr MeV}$, as well as significantly improve on the uncertainties of the existing data. In the available region of momentum transfer, it is expected that the hadron-based picture of the nucleon-nucleon interaction begins to break down and quark and gluon degrees of freedom become important.

The excitation energy resolution will be 1.5 MeV, providing a separation from the elastic process, as well as allowing a measurement of the E_{np} dependence of the cross section. We request a total beam time of 20 days and an additional 4 days for setup and decommissioning.