

LOI12-13-001: “*Timelike Compton Scattering in e^+e^- pair production on the pair production on the proton with SoLID at 11 GeV*”

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This letter of intent proposes the measurement of exclusive e^+e^- production using a polarized 11 GeV beam. The particular reaction to be studied is $\gamma p \rightarrow \gamma^* \rightarrow p' e^+ e^-$. This process is the timelike equivalent of Deeply Virtual Compton Scattering (DVCS) that involves spacelike virtual photons. The process of Timelike Compton Scattering (TCS) is sensitive to the real part of the Compton form factors and provides information complementary to that obtained from DVCS. In particular, the study of the real part of the Compton amplitude would provide information about the so-called D -term, the function that has a fundamental nature that contains information about the nucleon structure inaccessible through inclusive measurements of ordinary parton distribution. There was a strong recent progress in the QCD/GPD studies of TCS, which essentially enhanced the theoretical understanding of this novel process.

My conclusion is that the intended experiment is very interesting from theoretical point of view and its feasibility from experimental side is definitely worth of study.