Abstract Submitted
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Nuclear Structure Observable with Polarized Target and Polarized Real Photon Beam at Mainz Microtron[1] DILLI PAUDYAL, Univ of Regina — The nucleon polarizabilities are fundamental structure observables, like the nucleon mass or charge. While the electric (α_{E1}) and magnetic (β_{M1}) scalar polarizabilities of the nucleon have been measured, little effort has been made to extract the spin dependent polarizabilities. These nucleon polarizabilities, $\gamma_{E_1E_1}, \gamma_{M_1M_1}, \gamma_{M_1E_2}$ and $\gamma_{E_1M_2}$ describe the spin response of a proton to electric and magnetic dipole and quadrupole interactions. We plan to extract them using polarized photon beam and polarized target at the MAMI tagged photon facility in Mainz, Germany. This requires precise measurement of the double polarization observable $\sum_{2z}$ which is sensitive to these polarizabilities. The $\sum_{2z}$ is measured via a circularly polarized photon beam on a longitudinally polarized butanol target in the resonance region ($E = 250 - 310$ MeV). Together with constraints from α_{E1} and β_{M1}, the forward spin polarizability (γ_0), and QCD based models, should allow us to extract all four spin polarizabilities. This presentation will be focused on the preliminary experimental results for the measurement of $\sum_{2z}$ at different energies and angles.

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