

# Electromagnetic Calorimeter studies for the $GEp(5)$ experiment

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## Abstract

The  $GEp(5)$  experiment, part of the SBS collaboration, will be the fourth measurement of the  $G_{Ep}/G_{Mp}$  ratio using the proton recoil polarization technique. The current data suggests that the  $G_{Ep}/G_{Mp}$  ratio obtained with this technique, might cross zero near  $Q^2 \sim 10 \text{ GeV}^2$ , now reachable with the CEBAF upgrade to 12  $\text{GeV}$  energy beam. This measurement technique requires a precise measurement of the energy and angles of the scattered electron in coincidence with the recoil proton. The electron's measured energy and crude position will be used in the trigger, while the offline position measurement will be used in kinematic cuts to separate the elastic process from the background.

A lead-glass calorimeter, which was used in the previous experiments, is not optimal for the planned experiment due to the rapid radiation damage in the experiment's running conditions. A sampling calorimeter, made of lead and plastic scintillators, is under consideration. Results from a test beam and MC simulations of this kind of calorimeter are presented.