Contribution ID: **69** Type: **Talk in workshop 2: "AI & ML in nuclear science: starting with design, optimization, and operation of the machine and detectors, to data analysis"**

The proton electromagnetic generalized polarizabilities

The electromagnetic polarizabilities of the proton are fundamental structure constants, that describe the proton's response to an external electromagnetic (EM) field and quantify the deformation of the charge and magnetization distributions inside the proton caused by the electric or magnetic field, respectively. When studied through the virtual Compton scattering process, the virtuality of the photon provides access to the generalized polarizabilities, that open a powerful path to study the internal structure of the proton e.g. they map out the spatial distribution of the polarization densities in the proton, they provide access to key dynamical mechanisms that contribute to the electric and the magnetic polarizability effects, and allow to determine fundamental characteristics of the system, such as the electric and the magnetic polarizability radii. This talk will briefly review the recent progress on the topic, followed by a discussion of the VCS-II experiment that will have the first phase of data-taking in the spring of 2026 at Hall C/JLab, as well as of the future experimental program for the VCS measurements with a polarized electron beam at JLab (VCS-IIIp) that was recently approved by the JLab PAC.

Author: SPARVERIS, Nikos

Presenter: SPARVERIS, Nikos

Session Classification: Parallel Workshop 2