**Extraction of the Proton Radius from Electron Scattering Data**

DOUGLAS HIGINBOTHAM, Jefferson Lab — The proton radius is commonly extracted from elastic electron scattering data from fits that attempt to determine the slope of the cross section via extrapolations to zero momentum transfer. From the collection of published fits, it is clear that it is possible for different radii to be extracted from exactly the same data depending on how exactly the extraction is done. To understand the source of these differences, we review older fitting techniques and apply them to the modern data. This allows us to effectively make use of the idea of training data and then validation data. We also make use of statistical techniques such as cross validation and statistical bootstrapping to try to understand if certain data points in the world data are the source of these seemingly discrepant results. We will also discuss the interplay between bias and variance.

Douglas Higinbotham
Jefferson Lab