

DNP16-2016-000455

Abstract for an Invited Paper
for the DNP16 Meeting of
the American Physical Society

Applying Occam's Razor To The Proton Radius Puzzle

DOUGLAS HIGINBOTHAM, Jefferson Lab

Over the past five decades, ever more complex mathematical functions have been used to extract the radius of the proton from electron scattering data. For example, in 1963 the proton radius was extracted with linear and quadratic fits of low Q^2 data ($< 3 \text{ fm}^{-2}$) and by 2014 a non-linear regression of two tenth order power series functions with thirty-one normalization parameters and data out to 25 fm^{-2} was used. But for electron scattering, the radius of the proton is determined by extracting the slope of the charge form factor at a Q^2 of zero. By using higher precision data than was available in 1963 and focusing on the low Q^2 data from 1974 to today, we find extrapolating functions consistently produce a proton radius of around 0.84 fm. A result that is in agreement with modern Lamb shift measurements.