

Center For Neutrino Physics Seminar

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Applying Statistical Modeling Techniques To The Proton Radius Puzzle

Wednesday, March 29th, 2017

4:00pm - 5:00pm

304 Robeson Hall

Recent measurements using the Lamb shift in Muonic hydrogen have determined the proton's charge radius to be 0.84 fm; while the CODATA value, which is determined from atomic hydrogen Lamb shift and electron scattering measurements, is 0.88 fm. As the proton has only one true radius, the systematic difference the radius extracted from different measurement techniques has become known as the proton radius puzzle. I will summarize the history proton radius results and I will then discuss the pure statistical methods that were recently used by groups in Virginia (JLab, UVA, and W&M) that yield an electron scattering result that is in agreement with the Muonic hydrogen Lamb shift results. I will also discuss the important distinction between linear regression and non-linear regressions as well as the trade-off between bias and variance.