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How Analytic Choices Can Affect the Extraction of Electromagnetic Form Factors DOUGLAS HIGINBOTHAM, SCOTT BARCUS, Jefferson Lab — Scientists often try to incorporate prior knowledge into their regression algorithms, such as a particular analytic behavior or a known value at a kinematic endpoint. Unfortunately, there is often no unique way to make use of this prior knowledge, and thus, different analytic choices can lead to very different regression results from the same set of data. These choices can included items such as the function that is being used to fit the data or even the binning of the data. We will show for the Mainz proton elastic scattering data, with its 1422 data points and 31 normalization parameters, how these types of choices can affect the extraction of the proton's electromagnetic form factors. These results also demonstrate why it is critical when using regression algorithms to have either a physical model in mind or a firm mathematical basis.

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