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**Sharon M. Frechette\*** (sfrechet@holycross.edu), **Matthew Papanikolas**, **Jonathan Root** and **M. Valentina Vega**. *Gaussian Hypergeometric Series and Counting Points on Families of Hypersurfaces*. Preliminary report.

Hypergeometric functions over finite fields  $\mathbb{F}_p$ , also known as *Gaussian hypergeometric series*, were introduced by Greene in the 1980's as character sum analogues to the classical hypergeometric series first studied by Gauss. These functions possess many interesting properties analogous to the transformation laws and other formulas satisfied by their classical counterparts. In recent years, researchers have demonstrated connections between special values of Gaussian hypergeometric series and the likes of Fourier coefficients of modular forms, periods of elliptic curves, and the number of  $\mathbb{F}_p$ -points on algebraic varieties. We further explore this number-theoretic significance through new examples, including higher-dimensional analogues of the Hesse family of elliptic curves. In particular, we show how to express the number of  $\mathbb{F}_p$ -points on these hypersurfaces in terms of special values of Gaussian hypergeometric series. (Received September 21, 2015)