1135-12-702 **Moises R Delgado*** (moises.delgado@upr.edu). *Transversal intersection for absolute irreducibility of hyperplane sections of generalized Fermat varieties and on the conjecture on exceptional APN Functions.*

The decomposition of a Fermat variety $X$ defined by the multivariate polynomial of degree $n$, $\phi(x, y, z) = f(x)+f(y)+f(z)$ in $P^3(\mathbb{F}_2)$, where $f$ is a function on a finite field $F$, plays a crucial part in the study of APN functions and exceptional APN functions. For the exceptional numbers, $n = 2^k + 1$ and $n = 2^{2k} - 2^k + 1$ (Gold and Kasami-Welch numbers, respectively) very important results have been obtained. In this talk we explore $X$ related to the Kasami-Welch degree monomials and its decomposition into absolutely irreducible components. We show that, in this decomposition, the components intersect transversally at a singular point. This structural fact implies that the corresponding Fermat varieties, related to Kasami-Welch degree polynomial families, are absolutely irreducible. Consequently, these new families contribute substantially to the proof of the conjecture of exceptional APN functions on the hardest case: The Kasami-Welch degree case. (Received September 13, 2017)