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and its Applications to Coding Theory

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Title: Frobenius nonclassicality of Fermat curves with respect to cubics

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Abstract: For Fermat curves $\mathcal{F} : aX^n + bY^n = Z^n$ defined over \mathbb{F}_q , we establish necessary and sufficient conditions for \mathcal{F} to be \mathbb{F}_q -Frobenius nonclassical with respect to the linear system of plane cubics. In the new \mathbb{F}_q -Frobenius nonclassical cases, we determine explicit formulas for the number $N_q(\mathcal{F})$ of \mathbb{F}_q -rational points on \mathcal{F} . For the remaining Fermat curves, nice upper bounds for $N_q(\mathcal{F})$ are immediately given by the Stöhr-Voloch Theory.

This talk is based in a joint work with Herivelto Borges.