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Peter Sin (sin@ufl.edu), Gainesville, FL 32611, **Junhua Wu*** (jwu@lanecollege.edu), Jackson, TN , and **Qing Xiang** (xiang@math.udel.edu), Newark, DE 19716. *Dimensions of some binary codes arising from a conic in $PG(2, q)$.*

Let \mathcal{O} be a conic in the classical projective plane $PG(2, q)$, where q is an odd prime power. With respect to \mathcal{O} , the lines of $PG(2, q)$ are classified as passant, tangent, and secant lines, and the points of $PG(2, q)$ are classified as internal, absolute and external points. The incidence matrices between the secant/passant lines and the external/internal points were used to produce several classes of structured low-density parity-check binary codes. In particular, the dimension formula for the binary code \mathcal{L} , which arises as the \mathbb{F}_2 -null space of the incidence matrix between the secant lines and the external points to \mathcal{O} , was conjectured. In this talk, we present a proof for the conjecture on the dimension of \mathcal{L} by using a combination of techniques from finite geometry and modular representation theory. (Received September 14, 2010)