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Rebecca Bellovin, Sharon Anne Garthwaite, Ekin Ozman, Rachel Pries*
(pries@math.colostate.edu), **Cassandra Williams** and **Hui June Zhu**. *Newton polygons for a variant of the Kloosterman family.*

Given a Laurent polynomial f in n variables defined over a finite field of characteristic p , one can associate to it the L -function of the exponential sum of f . Under a non-degeneracy condition, the L -function or its reciprocal is a polynomial, and the p -adic valuations of the roots of this polynomial can be studied using its Newton polygon $NP(f)$.

Also associated to f is a convex n -dimensional polytope Δ . The Hodge polygon of Δ is a combinatorial object which is a lower bound for $NP(f)$. In this paper, we apply Wan's simplicial decomposition theory to determine the Newton polygons for several families of Laurent polynomials f under certain congruence conditions. Specifically, we study non-diagonal reflection and Kloosterman variants of a type of diagonal polynomial.

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