1041-14-270 **Ivan Soprunov** and **Jenya Soprunova*** (soprunova@math.kent.edu). *Toric Surface Codes and Minkowski Length of Polygons.*

We establish new lower bounds for the minimum distance of a toric surface code defined by a convex lattice polygon P. This translates to finding an upper bound for the number of F_q-zeros of bivariate polynomials whose support is contained in P. Our bounds involve a geometric invariant $L(P)$, called the full Minkowski length of P. We provide an explicit algorithm for finding $L(P)$ in polynomial time in the number of lattice points in P. These results are an application of the Hasse-Weil bound on the number of F_q-rational points of an irreducible algebraic curve. (Received August 12, 2008)