

1151-05-136

**Alex Kodess\*** (alex.kodess@farmingdale.edu). *The Isomorphism Problem for Monomial Digraphs.*

Let  $p$  be a prime, let  $e$  be a positive integer,  $q = p^e$ , and let  $\mathbb{F}_q$  denote the finite field of  $q$  elements. Let  $m, n$ ,  $1 \leq m, n \leq q - 1$ , be integers. The monomial digraph  $D = D(q; m, n)$  is defined as follows: the vertex set of  $D$  is  $\mathbb{F}_q^2$ , and  $((x_1, x_2), (y_1, y_2))$  is an arc in  $D$  if  $x_2 + y_2 = x_1^m y_1^n$ . We study the question of isomorphism of monomial digraphs  $D(q; m_1, n_1)$  and  $D(q; m_2, n_2)$ . We conjecture that  $D(q; m_1, n_1) \cong D(q; m_2, n_2)$  if and only if  $(m_2, n_2) = k(m_1, n_1)$  for some integer  $k$  coprime with  $(q - 1)$ . While the sufficiency of this condition is known, its necessity remains an open question. We present a number of partial results that support the conjecture. (Received August 15, 2019)