

NOTE

HAMILTONIAN CYCLE PROBLEM IN STRONG  
 $k$ -QUASI-TRANSITIVE DIGRAPHS  
WITH LARGE DIAMETER

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**Abstract**

Let  $k$  be an integer with  $k \geq 2$ . A digraph is  $k$ -quasi-transitive, if for any path  $x_0x_1 \dots x_k$  of length  $k$ ,  $x_0$  and  $x_k$  are adjacent. Let  $D$  be a strong  $k$ -quasi-transitive digraph with even  $k \geq 4$  and diameter at least  $k + 2$ . It has been shown that  $D$  has a Hamiltonian path. However, the Hamiltonian cycle problem in  $D$  is still open. In this paper, we shall show that  $D$  may contain no Hamiltonian cycle with  $k \geq 6$  and give the sufficient condition for  $D$  to be Hamiltonian.

**Keywords:** quasi-transitive digraph,  $k$ -quasi-transitive digraph, Hamiltonian cycle.

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