1061-05-53 **César Hernández Cruz*** (cesar@matem.unam.mx), Segovia #94, Col. Alamos, 03400 México, Mexico, and **Hortensia Galeana Sánchez**. *k-kernels in k-transitive and k-quasi-transitive digraphs.*

Let D be a digraph with set of vertices V and set of arcs A.

A (k,l)-kernel N of D is a k-independent (if $u,v \in N$ then $d(u,v), d(v,u) \geq k$) and l-absorbent (if $u \in V(D) - N$ then there exists $v \in N$ such that $d(u,v) \leq l$) set of vertices. A k-kernel is a $(k,k-1)$-kernel. A digraph D is transitive if $(u,v),(v,w) \in A$ implies that $(u,w) \in A$. A digraph D is quasi-transitive if $(u,v),(v,w) \in A$ implies (u,w) or $(w,u) \in A$. It has been proved that every transitive digraph has a k-kernel for every $k \geq 2$ and that every quasi-transitive digraph has a k-kernel for every $k \geq 3$.

A digraph D is k-transitive if whenever $(x_0,\dots,x_k)$ is a directed path in D, then $(x_0,x_k) \in A$; k-quasi-transitive digraphs are analogously defined, so (quasi-)transitive digraphs are 2-(quasi-)transitive digraphs. We prove structural results that imply that a k-transitive digraph has an n-kernel for every $n \geq k$; that for even $k \geq 2$, every k-quasi-transitive digraph has a n-kernel for every $n \geq k+2$; and that every 3-quasi-transitive digraph has k-kernel for every $k \geq 4$. Also, we prove that a k-quasi-transitive digraph has a $(k+1)$-king if and only if it has an unique initial strong component. (Received March 26, 2010)