H-kernels in 3-quasi-transitive digraphs

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Let H be a digraph possibly with loops and D a digraph without loops whose arcs are colored with the vertices of H (D is said to be an H-colored digraph). A directed path P in D is said to be an H-path if and only if the consecutive colors encountered on P form a directed walk in H. An H-kernel of an H-colored digraph D is a subset of vertices of D, say N, such that for every pair of different vertices in N there is no H-path between them, and for every vertex u in $V(D) \setminus N$ there exists an H-path in D from u to N. D is said to be 3-quasi-transitive if for every pair of vertices u and v of D, the existence of a directed path of length 3 from u to v implies that $\{(u,v),(v,u)\} \cap A(D) \neq \emptyset$. In this talk we show a result regarding the existence of H-kernels in 3-quasi-transitive digraphs; mainly the existence of H-kernels is guaranteed by means of sufficient conditions on the directed cycles of length 3 and 4.