

CHARACTERIZATION OF ASYMMETRIC CKI - DIGRAPHS WITH COVERING NUMBER AT MOST 3.

HORTENSIA GALEANA-SÁNCHEZ

*Instituto de Matemáticas,
Universidad Nacional Autónoma de México*

e-mail: hgaleana@matem.unam.mx

MIKA OLSEN

*Departamento de Matemáticas Aplicadas y Sistemas,
Universidad Autónoma Metropolitana - Cuajimalpa*

e-mail: olsen@correo.cua.uam.mx

A set $N \subseteq V(D)$ is said to be a kernel if N is an independent set and for every vertex $x \in (V(D) \setminus N)$ there is a vertex $y \in N$ such that $xy \in A(D)$. A digraph D is said to be critical kernel imperfect if every proper induced subdigraph of D has a kernel, but the digraph D does not have a kernel. In this paper we characterize the asymmetric critical kernel imperfect digraphs with covering number at most 3. Moreover, we prove that the only asymmetric critical kernel imperfect digraphs with covering number at most 3 are: \vec{C}_3 , \vec{C}_5 and $\vec{C}_7(1, 2)$. When the covering number of D or $Asym(D)$ is at most two, we use the connection between perfect graphs and the kernels, but for the case when the covering number of D or $Asym(D)$ is 3 this is not possible. Several interesting consequences are obtained.

Keywords: Digraphs, kernel, covering number.

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