C. Robin : When all holes have the same length

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A *hole* is an induced cycle of length at least 4. For an integer $k \geq 4$, we denote by $\mathcal{C}_k$, the class of graphs where every hole has length k.

We have defined a new class of graphs named *blowup of ℓ-templatse* whose all holes have length $2\ell + 1$. Using earlier results on other related classes of graphs, we did obtain the following structural theorem :

Theorem 1 *Let $\ell \geq 3$ be an integer. If G is a graph in $\mathcal{C}_{2\ell+1}$ then one of the following holds :*

— *G is a ring of length $2\ell + 1$ ([1]),*
— *G is a proper blowup of a twinless odd ℓ-template,*
— *G has a universal vertex,*
— *G has a clique cutset.*

The classes of perfect graphs ([2]) and even-hole-free graphs ([3]), both exclude holes depending on the parity of their length. For an even $k \geq 6$, $\mathcal{C}_k$ is a subclass of the class of perfect graphs and for an odd k, $\mathcal{C}_k$ is a subclass of even-hole-free graphs. The well known class of chordal graphs (graphs containing no hole) is trivially included in every $\mathcal{C}_k$

Linda Cook and Paul Seymour independently found a similar characterization.

Références

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[3] K. Vušković, *Even-hole-free graphs : A survey*, Applicable Analysis and Discrete Mathematics (2010), 4.