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COMMUNICATION

HAMILTONIAN PANCYCLIC GRAPHS

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R. Häggkvist [1] and J. Mitchem & E. Schmeichel [2] gave the same conjecture:

Conjecture. Let G be a hamiltonian graph on n vertices. If $\delta(G) \geq \frac{1}{5}(2n+1)$, then G is pancyclic or bipartite, and the bound is best possible.

We prove this conjecture (at least for $n \geq 162$).

Our proof is too long to be given here and will be published later. It is divided into 2 parts:

– For $3 \leq k \leq 9n/10$ we prove that there exists either a $C_{k-1} \nabla C_k$ or a $C_k \nabla C_{k+1}$ where $C_r \nabla C_{r+1}$ denotes the union of 2 cycles of length r and $r+1$ having a path of length $r-1$ in common.

– For $9n/10 \leq k \leq n-1$ we prove the existence of a C_k, the proof uses heavily the existence of a C_3; this fact was already proved by Häggkvist [1].

References

[1] R. Häggkvist, Odd cycles of specified length in non-bipartite graphs, in: B. Bollobás, ed., Proc. Cambridge 1980, Annals Discrete Math. 13 (1982) 89–100.

[2] J. Mitcham and E. Schmeichel, Pancyclic and bipancyclic graphs, in: Proc. Colorado Symposium on Graph Theory, to appear.