Every 3-connected claw-free Z_8 free graph is hamiltonian.

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Abstract

In this article, we first show that every 3-edge-connected graph with the circumference at most 8 is supereulerian, which is then applied to show that a 3-connected claw-free graph without Z_8 as an induced subgraph is hamiltonian, where Z_8 denotes the graph derived from identifying one endvertex of P_9 (a path with 9 vertices) with one vertex of a triangle. The above two results are both best possible in a sense that the number 8 can not be replaced by 9 and they also extend former results by Brousek, Ryjáček and Favaron in [Discrete Math. 196(1999)29-50] and by Łuczak and Pfender in [J. Graph Theory, 47(2004)111-121].