

Hamiltonian cycles in squares of graphs

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Abstract

It was shown in 1970 that the square of a block is hamiltonian. This implies that the square of a block is hamiltonian connected. The proof technique developed in this context and which proved to be quite far reaching involves the existence of various types of so called EPS-graphs in connected bridgeless graphs. The proofs are quite elaborate and long. However, since the 1990s short proofs of the 'square of a block theorem' were found by Riha (1991) and Georgakopoulos (2009), and a short proof of a more general theorem on special types of hamiltonian cycles in the square of a block (originally by H.F. in 1975) was published by Muettel and Rautenbach (2013). In more recent developments, F.H. and Gek Ling Chia proved the most general result for the square of a block to be hamiltonian connected. This gives rise to a description of the most general block-cutvertex structure of a graph G such that its square is hamiltonian (hamiltonian connected), again using EPS-graphs.