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The new neighbor condition and the upper embeddability of graph. (Chinese. English summary)
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Summary: Let \( N_G(u) \) denote the neighbor set of a vertex \( u \) in \( G \). At present, only a few results are known about the neighbor condition on the upper embeddability of graphs. Combined with the conditions of the neighbor set, the paper mainly proves the following result: let \( G \) be a 2-vertex-connected graph, for any two adjacent vertices \( u \) and \( v \), i.e., \( uv \in E(G) \), there exists \( a_i \in N_G(u) \), \( b_i \in N_G(v) \), and \( a_i \neq v \), \( b_i \neq u \), such that \( a_ib_i \in E(G) \) \((i = 1, 2)\), then \( G \) is upper embeddable.

MSC:

05C10 Planar graphs; geometric and topological aspects of graph theory
57M15 Relations of low-dimensional topology with graph theory

Keywords:
Betti deficiency; upper embeddability; neighbor set