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Lower bounds of the maximum genus on graphs in terms of diameter and girth. (Chinese. English summary) [Zbl 1119.05031]

Summary: This paper proves the following results: Let $G$ be a simple graph with diameter $d$. If its girth is not less than $d$, then the Betti deficient number $\xi(G)$ of $G$ is $\leq 1$, when $d \geq 4$ is even, i.e. $G$ is upper embeddable; and the Betti deficient number of $G$ is $\leq 2$, when $d \geq 3$ is odd, i.e. the maximum genus of $G$ is $\geq \frac{1}{2} \beta(G) - 1$.

MSC:
05C10 Planar graphs; geometric and topological aspects of graph theory

Keywords:
Betti deficiency number; upper embeddable; maximum genus