

## The forcing edge covering number of a graph

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### Abstract

An edge covering of  $G$  is a subset  $S \subseteq E(G)$  such that each vertex of  $G$  is end of some edge in  $S$ . The number of edges in a minimum edge covering of  $G$ , denoted by  $\beta'(G)$  is the edge covering number of  $G$ . A subset  $T \subseteq S$  is called a forcing subset for  $S$  if  $S$  is the unique minimum edge covering containing  $T$ . A forcing subset for  $S$  of minimum cardinality is a minimum forcing subset of  $S$ . The forcing edge covering number of  $S$ , denoted by  $f_{\beta'}(S)$ , is the cardinality of a minimum forcing subset of  $S$ . The forcing edge covering number of  $G$ , denoted by  $f_{\beta'}(G)$ , is  $f_{\beta'}(G) = \min\{f_{\beta'}(S)\}$ , where the minimum is taken over all minimum edge coverings  $S$  in  $G$ . Some general properties satisfied by this concept is studied. The forcing edge covering number of certain classes of graphs are determined. It is shown that for every pair  $a, b$  of integer with  $0 \leq a < b$  and  $b \geq 2$ , there exists a connected graph  $G$  such that  $f_{\beta'}(G) = a$  and  $\beta'(G) = b$ .

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