On Edge Domination of Graphs

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We present new results on edge domination of graphs, with focus on those described in a recent paper by Lin, Lozin, Moyano and Szwarcfiter, for perfect domination. Let G de a graph. Say that an edge $e \in E(G)$ *dominates* itself and all other edges adjacent to it. A subset $E' \subseteq E(G)$ is an *edge dominating set* of G, if every edge of $E(G)$ is dominated by an edge of E'. The interest is to determine a minimum cardinality edge dominating set of G. Some important variations of this problem are *efficient domination* and *perfect domination*. In the former variation, we require that each edge of $E(G)$ to be dominated exactly once, while in the latter the restriction is that each edge of $E(G) \setminus E'$ should be dominated exactly once. Efficient dominating sets are also known as *dominating induced matchings*. We describe algorithms and some complexity results of these problems, emphasizing the perfect edge dominating case.

Keywords: algorithms, complexity, edge domination, efficient domination, perfect domination.