Advances on Equimatchable Graphs

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A graph is called *equimatchable* (EQM for short) if every (inclusion-wise) maximal matching of it has the same size. EQM graphs can be seen as the matching counterpart of well-covered graphs defined as graphs having all of their maximal independent sets of the same size and which have been extensively studied in the literature. One can note that a graph is EQM if and only if its line graph is well-covered.
In this talk, we will survey both old and recent results about EQM graphs and point out several research directions. Most attention will be given to structural and algorithmic properties of EQM graphs. We will first exhibit an infinite family of forbidden subgraphs, whose existence is rather surprising since the property of being EQM is not hereditary as we will easily observe. Then we will consider the stability of the property of being EQM with respect to edge removals. We will emphasize the links between our results on edge-stable EQM graphs and the notion of shedding vertices for well-covered graphs, and point out some open questions.

Keywords: maximal matching, forbidden subgraphs, well-covered graphs, shedding vertex