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Constructions of some maximal exceptional graphs

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ABSTRACT

Graphs whose adjacency matrix has least eigenvalue greater than or equal to -2 have received much attention in the last 40 years. An exceptional graph is a connected graph with least eigenvalue greater than or equal to -2 which is not a generalized line graph. It is well known that each graph from this (finite) class is representable in the root system E_8 (in contrast to generalized line graphs which are representable in the root system D_n, $n \in N$). By making use of the star complement technique, all maximal exceptional graphs were recently found by a computer search (see [1]). There are 473 such graphs, and all but six of them have maximal (vertex) degree 28. In this contribution we give a computer independent proof of the latter fact. In addition, we determine (under some natural restrictions) all representations of these six graphs in E_8.

Reference

[1]   D. Cvetković, M. Lepović, P. Rowlinson, S. Simić, The maximal exceptional graphs, to appear.

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