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A CHARACTERIZATION FOR 2-SELF-CENTERED GRAPHS

MOHAMMAD HADI SHEKARRIZ

Department of Pure Mathematics, Ferdowsi University of Mashhad, Iran

joint work with Kamyar Mirzavaziri and Madjid Mirzavaziri

A graph is called *2-self-centered* if its diameter and radius both equal to 2. In this paper, we begin characterizing these graphs by characterizing edge-maximal 2-self-centered graphs via their compliments. Then we split characterizing edge-minimal 2-self-centered graphs into two cases. First, we characterize edge-minimal 2-self-centered graphs without triangles by introducing *intersecting bi-independent covering (IBIC)* and a structure named *generalized complete bipartite graph (GCBG)*. Then, we complete characterization by characterizing edge-minimal 2-self-centered graphs with some triangles. Hence, the main characterization is done since a graph is 2-self-centered if and only if it is a spanning subgraph of some edge-maximal 2-self-centered graphs and at the same time it is a spanning supergraph of some edge-minimal 2-self-centered graphs.

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