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Strongly regular decompositions derived from regular two-graphs

A *strongly regular decomposition* is a strongly regular graph admitting a partition of the vertex set into two parts on which the induced graphs are strongly regular. These decompositions provide examples of strongly regular designs or SRDs. We investigate an infinite family of such graphs in which there are two possible decompositions, giving two SRDs, and show that existence of either one implies existence of the other. A graph in this family thus provides a single structure linking 5 (well, actually 7 as will be explained in the talk) strongly regular graphs.