On the spectra of orientations of $K_4 - e$

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Let K_n^* denote the complete symmetric digraph, that is, the digraph obtained by replacing each edge of the complete graph on n vertices by a directed 2-cycle. We consider decomposing K_n^* into a digraph D where D is obtained by orienting the edges of the multigraph formed by doubling one of the edges of $K_4 - e$. We find necessary and sufficient conditions for the existence of such a decomposition of K_n^* for 8 such digraphs D.

Keywords: decomposition, digraph, spectrum