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The conductivity of the connected sum of root graphs with a common nullspace

Two connected root–graphs, H_1 and H_2, with isomorphic subgraphs $H_1 - z_1$ and $H_2 - z_2$, are glued together to form their connected-sum Z. If their μ–eigenspace is generated by vector $\mathbf{y}$ for some eigenvalue μ of their 0-1-adjacency matrix, then the μ-multiplicity of Z is shown to depend on the μ–type of z_1 and z_2 in the root–graphs. A sufficient condition for the uniqueness of $H_1 (\simeq H_2)$, for a given $\mathbf{y}$, when constructed from $H_1 - z_1$, is also established. The SSP model for ballistic conduction in a pi-molecule predicts that 5 out of the 11 feasible MEDs can be Z.