A SPECIAL PROPERTY OF RESISTANCE MATRICES

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Abstract. We deduce a new property exhibited by the resistance matrices of connected graphs. Specifically, we show that if $R = (r_{ij})$ is the resistance matrix of a connected graph on n vertices, then every off-diagonal entry in the Moore-Penrose inverse of

$$\text{Diag}(\sum_{j=1}^{n} r_{1j}, \ldots, \sum_{j=1}^{n} r_{nj}) - R$$

is negative. Thus, we establish that the Moore-Penrose inverse of the resistance Laplacian matrices are **M**-matrices.

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