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ABSTRACT

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Green kernel and power series on networks

Abstract: We introduce a Green kernel and analogues of other related kernels for finite and infinite networks whose edge weights are complex-valued admittances with positive real part. More precisely, network is graph, whose each edge possess a weight (admittance) and admittance of an edge xy can be presented as

$$\rho_{xy}^{(s)} = \frac{s}{L_{xy}s^2 + R_{xy}s + D_{xy}},$$

where $L_{xy}^2 + R_{xy}^2 + D_{xy}^2 \geqslant 0,\ L_{xy}, R_{xy}, D_{xy} > 0$ and we consider all $s \in \mathbb{C}$ with positive real part.

We investigate properties of the kernels and relate them to power series, similarly to classical discrete Markov chain case.

[1] Anna Muranova, Wolfgang Woess. Networks with complex weights: Green function and power series. *MDPI Mathematics*, 10(5):820 (2022)