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Prox-Regularity of Spectral Functions and Spectral Sets

Important properties such as differentiability and convexity of symmetric functions in \mathbb{R}^n can be transferred to the corresponding spectral functions and vice-versa. Continuing to build on this line of research, we hereby prove that a spectral function $F: \mathbf{S}^n \rightarrow \mathbb{R} \cup \{+\infty\}$ is prox-regular if and only if the underlying symmetric function $f: \mathbb{R}^n \rightarrow \mathbb{R} \cup \{+\infty\}$ is prox-regular. Relevant properties of symmetric sets are also discussed.

Keywords: Spectral function, prox-regular function, eigenvalue optimization, invariant function, permutation theory.

MSC: 15A18, 49J52; 47A75, 90C22