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The extremal $p$-spectral radius of Berge hypergraphs. (English) Zbl 1458.05181

Summary: Let $G$ be a graph. We say that a hypergraph $H$ is a Berge-$G$ if there is a bijection $\phi : E(G) \to E(H)$ such that $e \subseteq \phi(e)$ for all $e \in E(G)$. For any $r$-uniform hypergraph $H$ and a real number $p \geq 1$, the $p$-spectral radius $\lambda^{(p)}(H)$ of $H$ is defined as

$$\lambda^{(p)}(H) := \max_{x \in \mathbb{R}^n, \|x\|_p=1} \sum_{\{i_1, i_2, \ldots, i_r\} \in E(H)} x_{i_1} x_{i_2} \cdots x_{i_r}.$$ 

In this paper, we study the $p$-spectral radius of Berge-$G$ hypergraphs. We determine the 3-uniform hypergraphs with maximum $p$-spectral radius for $p \geq 1$ among Berge-$G$ hypergraphs when $G$ is a path, a cycle or a star.

MSC:

05C65 Hypergraphs
15A18 Eigenvalues, singular values, and eigenvectors

Keywords:

uniform hypergraph; $p$-spectral radius; Berge hypergraph

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References:


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