Join of hypergraphs and their spectra

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1 Abstract

In this presentation, we represent a general hypergraph by a matrix and study its spectrum. We extend the definition of equitable partition and joining operation for hypergraphs, and use those to compute eigenvalues of different hypergraphs. We derive the characteristics polynomial of a complete m-uniform m-partite hypergraph $K^m_{n_1,n_2,\ldots,n_m}$. Studying edge corona of hypergraphs we find the complete spectrum of s-loose cycles $C^m_{L(s;n)}$ for $m \geq 2s+1$ and the characteristics polynomial of a s-loose paths $P^{(m)}_{L(s;n)}$. Some of the eigenvalues of $P^{(m)}_{L(s;n)}$ are also derived. Moreover, using vertex corona, we show how to generate infinitely many pairs of non-isomorphic co-spectral hypergraphs.