

## **Eigenvalues and connected factors in regular multigraphs**

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In this talk, we prove a sharp upper bound for the second largest eigenvalue in an  $r$ -regular graph  $G$  to guarantee that  $G$  contains at least two disjoint spanning trees. By utilizing the result, we prove the sharp upper bound for the second largest eigenvalue in an  $r$ -regular multigraph to guarantee the existence of a connected parity factor.

Keywords: Eigenvalues, connected parity factors, and regular multigraphs