

## Isospectral magnetic graphs

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We present a new geometrical construction leading to an infinite collection of families of graphs, where all the elements in each family are (finite) isospectral non-isomorphic graphs for the discrete magnetic Laplacian with normalised weights (in particular for standard weights). The construction is based on the notion of isospectral frames which, together with the  $s$ -partition of a natural number  $r$ , define the isospectral families of graphs by contraction of distinguished vertices. The isospectral frames have high symmetry and we use a spectral preorder of graphs studied in [2,3] to control the spectral spreading of the eigenvalues under elementary perturbations of the graph like vertex contraction and vertex virtualisation.

*References:*

- [1] J.S. Fabila-Carrasco, F. Lledó and O. Post, *A geometric construction of isospectral magnetic graphs*, 2021 (in preparation).
- [2] J.S. Fabila-Carrasco, F. Lledó and O. Post, *Spectral preorder and perturbations of discrete weighted graphs*, Math. Ann. 2020, DOI: <https://doi.org/10.1007/s00208-020-02091-5>
- [3] J.S. Fabila-Carrasco, F. Lledó and O. Post, *Spectral gaps and discrete magnetic Laplacians*, Lin. Alg. Appl. **547** (2018) 183-216