

Clique complexes of multigraphs

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A multigraph is a graph with allowed multiple edges. A clique in a multigraph is a subgraph isomorphic to a complete graph. Collection of all cliques is a simplicial poset, we call it the clique complex of a multigraph.

Each multigraph can be blown down to a simple graph by forgetting multiplicities. We proved a homotopy wedge decomposition for clique complexes of multigraphs. Essentially, the topology of clique complexes of multigraphs is determined by the clique complexes of the underlying graphs and their links.

A closely related construction of simplex inflation in a simplicial complex allows to generate many Cohen-Macaulay simplicial posets from a given one. I will show some examples and hope to discuss possible relations of multigraphs to toric topology.