Generalisations of hypomorphisms

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(joint work with Peter Czimmermann)

A hypomorphism from the graph G to the graph H is a bijection f between their vertex sets such that the vertex-deleted subgraphs $G - v$ and $H - f(v)$ are isomorphic for all vertices v from G.

A k-hypomorphism is a bijection f between collections of k element subsets of vertices of graphs G and H such that the graphs $G - X$ and $H - f(X)$ are isomorphic for every k element subset X of the set $V(G)$.

We study k-hypomorphisms with special properties which lead to alternative representations of graph isomorphisms, automorphisms, groups of automorphism, vertex stabilizers of graphs and pseudosimilarity. We consider some extensions of our results to be hypergraphs. We also suggest some generalisations of k-hypomorphisms, for which we would obtain similar results.