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Lexicographic Products and High Reconstruction Numbers

The *reconstruction number* of a graph is the smallest number of vertex deleted subgraphs needed to uniquely determine the graph up to isomorphism. Bollobas proved that almost all graphs have reconstruction number three. McMullen and Radziszowski have published a catalogue of all graphs on at most ten vertices with reconstruction number greater than three, i.e., graphs with *high reconstruction number*. We introduce constructions that generalize the examples identified in their work. In particular, we use lexicographic products of vertex transitive graphs with certain starter graphs from the work of Harary and Plantholt to generate new infinite families of graphs with high reconstruction numbers. In the process, we settle a question of McMullen and Radziszowski.

This is joint work with Gena Hahn, Stacey Lamont, and Chester Lipka.