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Short Paths in Generalizations of the Sierpinski Carpet. Preliminary report.

In this talk we address several questions about shortest paths between two points in a 3-parameter family of fractals that naturally generalize the Sierpinski carpet. We focus on shortest taxicab paths, which are piecewise linear paths whose components are parallel to coordinate axes, with nontrivial limiting behavior typically necessary to join arbitrary pairs of endpoints. We provide a framework which allows for the construction of a shortest taxicab path between any two endpoints for all members of the family. We also provide a tight upper bound on the ratio of the path length to the Euclidean distance between the endpoints, answering a question of L. Cristea. (Received September 10, 2019)