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Samuel Lin, Benjamin Schmidt and Craig Sutton* (craig.j.sutton@dartmouth.edu),
Dartmouth College, Department of Mathematics, Hanover, NH 03755. *Towards hearing
three-dimensional geometric structures, Part I.*

The positive resolution of the geometrization conjecture shows that geometric structures (i.e., complete locally homogeneous metrics) play a special role in our understanding of the taxonomy of three-dimensional manifolds. In light of this, we initiate the exploration of the extent to which three-dimensional geometric structures are determined by their spectra. For example, we find that among locally homogeneous manifolds, closed three-manifolds modeled on six of the eight Thurston geometries are determined up to universal Riemannian cover by their spectra, a result that includes all compact locally symmetric spaces. More generally, we obtain results concerning spaces modeled on “metrically maximal geometries.” (Received January 17, 2021)