

AdS Tomography

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We review boundary rigidity theorems assessing that, under appropriate conditions, Riemannian manifolds with the same spectrum of boundary geodesics are isometric. We show how to apply these theorems to the problem of reconstructing a $d + 1$ dimensional, negative curvature space-time from boundary data associated to two-point functions of high-dimension local operators in a conformal field theory. We also show simple, physically relevant examples of negative-curvature spaces that fail to satisfy in a subtle way some of the assumptions of rigidity theorems. In those examples, we explicitly show that the spectrum of boundary geodesics is not sufficient to reconstruct the metric in the bulk. We also survey other reconstruction procedures and comment on their possible implementation in the context of the holographic AdS/CFT duality.