

Discussion of the paper by C. Croke, "Rigidity and
the Distance Between Boundary Points",
J.Diff.Geom.33 (1991)

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I will present some of the results in C.Croke, "Rigidity and the Distance Between Boundary Points", J.Diff.Geom.33 (1991). The results are for different types of boundary rigidity problems, which are generally of the following form: Let (M, g) be a Riemannian manifold with a boundary, of which we have some a priori knowledge. Let $d : \partial M \times \partial M \rightarrow \mathbb{R}$ be the restriction of the induced distance function into the boundary. Given $(\partial M, d)$, can we recover (M, g) ? I will present the proof of the following: If all segments of geodesics between boundary points strongly minimize and if $g = f^2 g_0$ for some known (M, g_0) , then $g = g_0$. I will also consider some concrete counterexamples and other related results.