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Gunther Uhlmann* (gunther@math.washington.edu), Department of Mathematics UW, Box 354350, Seattle, WA 98195, and **Yaroslav Kurylev** and **Matti Lassas**. *The broken scattering relation and inverse problems.*

Consider a Riemannian manifold with boundary. The broken scattering relation gives the exit point and exit direction from the manifold of a once broken geodesic. We give a sketch of the proof that if we know the broken scattering relation we can determine the Riemannian manifold including the metric. We give applications of this result to several inverse problems arising in seismic imaging and optical tomography. (Received September 19, 2007)