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**Mark Hubenthal\*** ([hubenjm@math.uh.edu](mailto:hubenjm@math.uh.edu)), University of Houston, Department of Mathematics, 651 PGH, Houston, TX 77204-3008. *The Broken Ray Transform in  $n$  Dimensions with Flat Reflecting Boundary.*

This article is concerned with the broken ray transform on  $n$ -dimensional Euclidean domains where the reflecting parts of the boundary are flat. In particular, given a subset  $E$  of the boundary  $\partial\Omega$  such that  $\partial\Omega \setminus E$  is itself flat (contained in a union of hyperplanes), we measure the attenuation of all broken rays starting and ending at  $E$  with the standard optical reflection rule applied to  $\partial\Omega \setminus E$ . The main technique is to localize the measurement operator around broken rays which reflect off a fixed sequence of hyperplanes and then to apply the analytic microlocal approach of Frigyik, Stefanov, and Uhlmann for the ordinary X-ray transform via a path unfolding. We can then establish injectivity and stability under certain conditions. This generalizes the author's previous result for the square, although we can no longer treat reflections from corner points. (Received December 23, 2013)