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**Marius Mitrea\*** ([mitream@missouri.edu](mailto:mitream@missouri.edu)), Department of Mathematics, University of Missouri, Columbia, MO 65211. *Characterizing geometric regularity of sets via the behavior of the Riesz transforms*. Preliminary report.

Under mild geometric measure theoretic assumptions on an open set we show that the Riesz transforms on its boundary are continuous mappings on the Hölder space if and only if the set in question is a Lyapunov domain. As a limiting case, we also characterize Reifenberg flatness in terms of the behavior of the Riesz transforms. This is joint work with Dorina Mitrea and Joan Verdera. (Received August 15, 2014)