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Ugur G Abdulla* (abdulla@fit.edu), 150 West Univ Blvd, Melbourne, FL 32901. *Wiener test for the Regularity of ∞ for Elliptic Equations with Measurable Coefficients and Its Consequences.*

We introduce a notion of regularity (or irregularity) of the point at infinity (∞) for the unbounded open set $\Omega \subset R^N$ concerning second order uniformly elliptic equations with bounded and measurable coefficients, according as whether the \mathcal{A} - harmonic measure of ∞ is zero (or positive). A necessary and sufficient condition for the existence of a unique bounded solution to the Dirichlet problem in an arbitrary open set of R^N , $N \geq 3$ is established in terms of the Wiener test for the regularity of ∞ . It coincides with the Wiener test for the regularity of ∞ in the case of Laplace equation. From the topological point of view, the Wiener test at ∞ presents thinness criteria of sets near ∞ in fine topology. Precisely, the open set is a deleted neighborhood of ∞ in fine topology if and only if ∞ is irregular. (Received January 03, 2012)