Boundary structure and size in terms of interior and exterior harmonic measure

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Abstract

In the late 80's Wolff constructed domains in $\mathbf{R^3}$ whose harmonic measure had the Hausdorff dimension either strictly less than 2 or strictly greater than 2. Lewis, Verchota and Vogel [LVV] improved this construction to obtain domains in $\mathbf{R^n}$ whose interior and exterior harmonic measures both have Hausdorff dimension strictly less than $n-1$ or strictly greater than $n-1$. In recent work with C. Kenig and D. Preiss we study the case when the exterior and interior harmonic measures are mutually absolutely continuous. Our results bear some resemblance to McMillan's theorem in $\mathbf{R^2}$.