Cantón, Alicia (E-MADA); Fernández, José L. [Fernández Pérez, José Luis] (E-MADA); Pestana, Domingo (E-CARL); Rodríguez, José M. [Rodríguez Garcia, José Manuel] (E-CARL)

On harmonic functions on trees. (English summary)


The main result of the paper is an extension of Bourgain’s theorem from complex analysis to the case of bounded harmonic functions on trees. If $T$ stands for a regular tree, $\text{Dim}$ for the Hausdorff dimension, $\text{BV}(u)$ denotes the set of paths in $\partial T$ along which $u$ has bounded variation, then it is proved that for any positive superharmonic function $u$ on $T$, $\text{Dim}(\text{BV}(u)) = \text{Dim}(\partial T) = 1$.

Studying the asymptotic behaviour of $p$-harmonic functions, the authors also show that for every $1 < p < \infty$ there exists a regular directed tree and a bounded $p$-harmonic function $u$ with infinite variation along almost every path in $\partial T$. The proof is based on a probabilistic approach. All the (sometimes very technical) proofs are given in detail.

Reviewed by Klaus Görlebeck

References


*Note: This list reflects references listed in the original paper as accurately as possible with no attempt to correct errors.*

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