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GROWTH AND ASYMPTOTIC SETS OF SUBHARMONIC FUNCTIONS II

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Abstract

We study the relation between the growth of a subharmonic function in the half space $\mathbb{R}^{n+1}_+$ and the size of its asymptotic set. In particular, we prove that for any $n \geq 1$ and $0 < \alpha \leq n$, there exists a subharmonic function u in the $\mathbb{R}^{n+1}_+$ satisfying the growth condition of order $\alpha : u(x) \leq x_{n+1}^{-\alpha}$ for $0 < x_{n+1} < 1$, such that the Hausdorff dimension of the asymptotic set $\bigcup_{\lambda \neq -\infty} A(\lambda)$ is exactly $n-\alpha$. Here $A(\lambda)$ is the set of boundary points at which f tends to λ along some curve. This proves the sharpness of a theorem due to Berman, Barth, Rippon, Sons, Fernández, Heinonen, Llorente and Gardiner cumulatively.

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