

LOWER BOUNDS FOR DIRICHLET ENERGY OF ENTIRE STABLE SOLUTIONS

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ABSTRACT. We provide some lower bounds on $\int_{B_R} |\nabla u|^2$, as a function of the radius $R > 0$, where u is a nonconstant stable solution of the equation $-\Delta u = f(u)$ in \mathbb{R}^N , being $f \in C^1(\mathbb{R})$ a general function.

These bounds are optimal for dimensions $N \geq 10$ and $N \leq 3$. This optimal lowest growing of $\int_{B_R} |\nabla u|^2$ is attained in radial solutions if $N \geq 10$. It is also shown that radial solutions cannot give an optimal lower bound for dimensions $N \leq 8$.

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