ABSTRACT

If the gradient of $u(x)$ is $n$-th power locally integrable on Euclidean $n$-space, then the integral average over a ball $B$ of the exponential of a constant multiple of $|u(x) - u_B|^{n/(n-1)}$, $u_B = \text{average of } u \text{ over } B$, tends to 1 as the radius of $B$ shrinks to zero – for quasi almost all center points. This refines a result of N. Trudinger (1967). We prove here a similar result for the class of gradients in $L^n(\log(c + L))$, $0 \leq \alpha \leq n - 1$. The results depend on a capacity strong type inequality for these spaces.