

**BREZIS-MERLE TYPE INEQUALITY FOR A WEAK
SOLUTION TO THE N -LAPLACIAN EQUATION IN
LORENTZ-ZYGMUND SPACES**

NORISUKE IOKU
MATHEMATICAL INSTITUTE, TOHOKU UNIVERSITY

We consider a regularity estimate for a solution of the homogeneous Dirichlet problem for N -Laplacian equations

$$\begin{cases} -\operatorname{div}(|\nabla u|^{N-2}\nabla u) = f, & x \in \Omega, \\ u = 0, & x \in \partial\Omega, \end{cases}$$

where Ω is a bounded domain in \mathbb{R}^N and an external force f is in $L^1(\Omega)$. Introducing the generalized Lorentz-Zygmund space, we show that the multiple exponential integrability of the Brezis-Merle type for an entropy solution of the Dirichlet problem of the N -Laplacian equation. We also discuss the condition on f that the solutions are bounded.