

Composition of q -quasiconformal mappings and functions in Orlicz-Sobolev spaces

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Let $\Omega \subset \mathbb{R}^n$, $q \geq n$ and $\alpha \geq 0$ or $1 < q \leq n$ and $\alpha \leq 0$. We show that the composition of q -quasiconformal mapping f and function $u \in WL^q \log^\alpha L_{\text{loc}}(f(\Omega))$ satisfies $u \circ f \in WL^q \log^\alpha L_{\text{loc}}(\Omega)$. Moreover each homeomorphism f which introduces continuous composition operator from $WL^q \log^\alpha L$ to $WL^q \log^\alpha L$ is necessarily a q -quasiconformal mapping. As a new tool we use a Lebesgue density type theorem for Orlicz spaces.