INTERIOR REGULARITY FOR MONGE-AMPERE EQUATIONS IN CRITICAL SOBOLEV SPACES

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We will prove that convex solutions of the Monge-Ampere equation $\det D^2 u = 1$ are smooth as soon as $u \in W^{2, n(n-1)/2}$, which is the critical Sobolev space in light of an example due to Pogorelov. More generally we will show that u does not agree with a supporting hyperplane on a set of dimension k provided $u \in W^{2, n(n-k)/2}$, which is also sharp. We will also explain analogous results for the complex Monge-Ampere equation.