

Singular Abreu equations and linearized Monge-Ampère equations with drifts

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摘要： We study the solvability of singular Abreu equations which arise in the approximation of convex functionals subject to a convexity constraint. Previous works established the solvability of their second boundary value problems either in two dimensions, or in higher dimensions under either a smallness condition or a radial symmetry condition. Here, we solve the higher dimensional case by transforming singular Abreu equations into linearized Monge-Ampère equations with drifts. We establish global Hölder estimates for the linearized Monge-Ampère equation with drifts under suitable hypotheses, and then use them to the regularity and solvability of the second boundary value problem for singular Abreu equations in higher dimensions. Many cases with general right-hand side will also be discussed.

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