

DISCRETE ALEKSANDROV SOLUTIONS OF THE MONGE-AMPÈRE EQUATION

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The Monge-Ampère equation is a nonlinear partial differential equation which appears in a wide range of applications, e.g. geometric optics and material sciences. We present convergence results for finite difference discretizations with the weak solution in the sense of Aleksandrov. The numerical solution is computed as the minimizer of a convex functional of the gradient and under convexity and nonlinear constraints. For monotone schemes we obtain uniform convergence on compact subsets and for the standard finite difference discretization, convergence of the discretization for approximate problems. The main tool used is approximation by smooth functions.

Part of this talk is based on joint work with R. Awi and L. Matamba Messi.

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