Recent Results on a Monge-Ampere Obstacle Problem and Related Topics

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In this talk, we study a Monge-Ampere obstacle problem, which was initially studied by Savin, and discuss related topics. First, we develop regularity properties for \det D^2 u=u^p, and establish Liouville theorems for its entire solutions . Next, we develop a variational framework for Aleksandrov estimates of convex solutions, identifying both isolated singularity problems and obstacle problems as extremal configurations, and establish refined Alexandrov-Bakelman-Pucci (ABP) estimates under suitable assumptions. Furthermore, we present a global version of these improved ABP estimates and extend a theorem of Caffarelli and Li. Finally, we may discuss the Monge-Ampere equations with multiple isolated singularities, with particular emphasis on how obstacle problems influence their structural behavior. These are joint works with Tianling Jin and Jingang Xiong.