

The eigenvalue problem for the Monge-Ampère operator on general bounded convex domains

NAM Q. LE

Abstract. In this paper, we study the eigenvalue problem for the Monge-Ampère operator on general bounded convex domains. We prove the existence, uniqueness and variational characterization of the Monge-Ampère eigenvalue. The convex Monge-Ampère eigenfunctions are shown to be unique up to positive multiplicative constants. Our results are the singular counterpart of previous results by P-L. Lions and K. Tso in the smooth, uniformly convex setting. Moreover, we prove the stability of the Monge-Ampère eigenvalue with respect to the Hausdorff convergence of the domains. This stability property makes it possible to investigate the Brunn-Minkowski, isoperimetric and reverse isoperimetric inequalities for the Monge-Ampère eigenvalue in their full generality. We also discuss related existence and regularity results for a class of degenerate Monge-Ampère equations.

Mathematics Subject Classification (2010): 47A75 (primary); 49R50, 35J70, 35J96 (secondary).