

Abstract

We introduce a functional involving weighted volume of convex bodies and their dual bodies and discuss the existence of critical points of the functional. Finding the critical points is equivalent to solving certain Monge-Ampere type equations which include the Minkowski problem in the sphere (i.e., prescribing the Gauss curvature in the sphere) and the prescribing centro-affine curvature problem in the Euclidean space. We will first survey some Minkowski type problems and then discuss solutions to the prescribing centro-affine curvature problem whose proof relies on the Gauss flow method, a variational method, and a topological argument.