

q -Moment Measures and Applications in Convex Geometry (I)

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Abstract: In 2017, Bo'az Klartag obtained a new result in differential geometry on the existence of affine hemisphere of elliptic type. In his approach, a surface is associated with every a convex function $\Phi : \mathbb{R}^n \rightarrow (0, +\infty)$, which is solution to the following PDEs of Monge–Ampère type

$$\det \left(\text{Hess} \varphi (x) \right) = \frac{c}{(\varphi (x))^{n+2}} \text{ in } \mathbb{R}^n \quad \text{and} \quad \nabla \varphi (\mathbb{R}^n) = L \quad (1)$$

In this talk, we review Klartag's results on "Affine hemispheres of elliptic type", and show that the existence of solutions of the equation (1) could be proved by using the problem of 2-moment measures, a particular case of q -moment measures, i.e measures of the form $(\nabla \Phi)_\# (\Phi^{-(n+q)})$ for $q > 0$.

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