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Galyna V Livshyts* (glivshyts6@math.gatech.edu), Georgia Institute of Technology, 686,
Cherry street NW, Atlanta, GA 30332. *On an extension of Minkowski's theorem for measures.*

The Minkowski theorem asserts that every centered measure on the unit sphere which is not concentrated on any great subsphere is the surface area measure of the (unique) convex body. L_p -Brunn-Minkowski theory has called for extensions of this theorem in which the surface area measure is replaced, for example, by cone volume measure of a convex body. Borozcky, Lutwak, Stancu, Saraglou, Yang, Zhang, and many others have contributed to the study of this topic.

In this talk we discuss another natural extension of Minkowski's theorem, in which the surface area measure is replaced by the surface area measure with respect to an underlying measure in \mathbb{R}^n , with certain concavity and homogeneity properties. This new theorem has several consequences. Firstly, it helps to establish uniqueness and existence of a solution of certain PDE in the class of even support functions of convex sets; this result is a weaker version of the Log-Minkowski conjecture. Secondly, we use this theorem to obtain an extension of the solution to Shephard's problem for some measures, after extending the notion of a projection appropriately. Thirdly, we prove an analogue of Aleksandrov's theorem about unique determination of a symmetric convex body with areas of its projections for certain measures. (Received August 24, 2016)