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Alina Stancu* (alina_stancu@uml.edu), Department of Mathematical Sciences, University of Massachusetts Lowell, Lowell, MA 01854. *On a question for illumination bodies.* Preliminary report.

If $K \subset \mathbb{R}^n$ is a convex body, and $\delta > 0$ is a real number, the δ -illumination body associated to K is defined by

$$K^\delta = \{x \in \mathbb{R}^n : Vol_n(\text{co}[x, K] \setminus K) \leq \delta\}.$$

As illumination bodies can be used to extend the definition of affine surface area to arbitrary convex bodies, a natural question is whether K homothetic to K^δ , for some δ , implies that K is an ellipsoid. We will show that, under some assumptions, the answer is positive and the statement can be generalized to a class of weighted illumination bodies. (Received February 12, 2006)