1046-52-1767 **Marton Naszodi*** (mnaszodi@math.ualberta.ca), 632 Central Academic Building, Department of Mathematics & Statistics, University of Alberta, Edmonton, Alberta T6G 2G1, Canada. *On Covering a Convex Set with Its Smaller Copies.*

We consider two topics closely related to the Gohberg – Markus – Boltyanski – Hadwiger Problem, which is to prove that every convex body in $\mathbb{R}^n$ is illuminated by 2^n directions. First, we present a new equivalent formulation of the problem, and introduce a fractional version of the illumination number. We show that for symmetric convex bodies, this number is at most 2^n. As a corollary, we obtain that for any symmetric convex polytope with k vertices, there is a direction that illuminates at least $\frac{k}{2^n}$ vertices.

Next, we answer the following question that was posed as Problem 6 in Section 3.2 of [**?**]: Let H_n denote the smallest integer k such that for every convex body K in $\mathbb{R}^n$ there is a $0 < \lambda < 1$ such that K is covered by k translates of λK. Can λ be chosen independently of K; that is, is there a $0 < \lambda_n < 1$ depending on n only with the property that every convex body K in $\mathbb{R}^n$ is covered by H_n translates of $\lambda_n K$? We prove the affirmative answer.

References

[1] Brass, P.; Moser, W.; Pach, J. *Research Problems in Discrete Geometry.* Springer, New York, 2005. xii+499 pp.

(Received September 16, 2008)