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Positsel′skiĭ, E. D.
Minkowski spaces with large projection constants. (Russian)
Mat. Zametki **37** (1985), *no. 2,* 262–267, 302.

The relative projection constant of a subspace X of a Banach space Z is the quantity $\lambda(X,Z) = \inf\|P\|$, where P runs over all linear projections of Z onto X. The projection constant of X is $\lambda(X) = \sup\lambda(X,Z)$, where the supremum is taken over all Banach spaces Z containing X. A systematic study of $\lambda(X)$ in the case of the Minkowski spaces $X = X^n$ was initiated by B. Grünbaum [Trans. Amer. Math. Soc. **95** (1960), 451–465; MR0114110 (22 #4937)], who also considered the constant $\lambda_n = \sup\lambda(X^n)$, where X^n runs over all n-dimensional Minkowski spaces, and conjectured that $\lambda_2 = \frac{4}{3}$, $\lambda_3 = \frac{3}{2}$, $\lambda_n \sim \sqrt{2n/\pi}$. The last conjecture was answered negatively by the author [Mat. Zametki **15** (1974), 719–727; MR0358299 (50 #10765)] and by Y. Gordon [Israel J. Math. **14** (1973), 50–62; MR0318842 (47 #7388)] by showing that $\lambda(M^n) \sim (2-\sqrt{2/\pi})^{-1}\cdot\sqrt{n}$ for a Marcinkiewicz space M^n. M. I. Kadets and M. G. Snobar [Mat. Zametki **10** (1971), 453–457; MR0291770 (45 #861)] proved that $\lambda(X^n) \le \sqrt{n}$. The author proves in this paper the existence of Minkowski spaces X^k such that $\lambda(X^3) = (\sqrt{5}+1)/2$, $\lambda(X^7) = \frac{5}{2}$, $\lambda(X^n) \sim \sqrt{2n/e}$, which give estimates for λ_n greater than those known before.

{English translation: Math. Notes **37** (1985), no. 1-2, 149–152.}

Reviewed by *S. Cobzaş*