1023-52-750   **Nigel Kalton**, **Alexander Koldobsky**, **Vladyslav Yaskin** and **Maryna Yaskina***,
Department of Mathematics, University of Oklahoma, Norman, OK 73019. *The geometry of L_0.*

Suppose that we have the unit Euclidean ball in $\mathbb{R}^n$ and construct new bodies using three operations - linear transformations, closure in the radial metric and multiplicative summation defined by $\|x\|_{K+_0L} = \sqrt{\|x\|_K\|x\|_L}$. We prove that in dimension 3 this procedure gives all origin symmetric convex bodies, while this is no longer true in dimensions 4 and higher. We introduce the concept of embedding of a normed space in L_0 that naturally extends the corresponding properties of L_p-spaces with $p \neq 0$, and show that the procedure described above gives exactly the unit balls of subspaces of L_0 in every dimension. We provide Fourier analytic and geometric characterizations of spaces embedding in L_0, and prove several facts confirming the place of L_0 in the scale of L_p-spaces. (Received September 21, 2006)