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Title: Almost transitive and maximal norms in Banach spaces

Abstract: This is a report on joint work with Beata Randrianantoanina. We prove that the spaces ℓ_p , $1 < p < \infty, p \neq 2$, and all infinite-dimensional subspaces of their quotient spaces do not admit equivalent almost transitive renormings. This answers a problem posed by Deville, Godefroy and Zizler in 1993. We obtain this as a consequence of a new property of almost transitive spaces with a Schauder basis, namely we prove that in such spaces the unit vector basis of ℓ_2^2 belongs to the two-dimensional asymptotic structure and we obtain some information about the asymptotic structure in higher dimensions. We also obtain several other results about properties of classical, Tsirelson type, and non-commutative Banach spaces with almost transitive norms.

Further, we prove that the spaces ℓ_p , $1 < p < \infty, p \neq 2$, have continuum different renormings with 1-unconditional bases each with a different maximal isometry group, and that every symmetric space other than ℓ_2 has at least a countable number of such renormings. On the other hand we show that the spaces ℓ_p , $1 < p < \infty, p \neq 2$, have continuum different renormings each with an isometry group which is not contained in any maximal bounded subgroup of the group of isomorphisms of ℓ_p . This answers a question of Wood.