Some Convergence Properties of Minkowski Functionals Given by Polytopes
An Abstract

In a topological vector space there is an intimate relationship between the Minkowski functionals defined on the space and the convex sets of the space. In finite dimensions, the Euclidean norm can be approximated by a Minkowski functional given by a convex set which adequately approximates the unit ball: a convex polytope with vertices sampled from the unit ball itself. Further, there is a simple geometric characterization for sequences of polytopes which give rise to a sequence of functionals that converge pointwise to the Euclidean norm.