Normal cones and Thompson's metric

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Abstract

The aim of this talk is to present some results related to Thompson's metric. A. C. Thompson, Proc. Amer. Math. Soc. 14 (1963), 438-443, defined a metric associated to a convex cone K in a Banach space X. The cone K determines an order on X and an equivalence relation defined through this order. Thompson defined a metric on each equivalence class C and proved that C is complete if the cone K is normal. One can show that the normality of K is also necessary for the completeness. Thompson proved also a fixed point theorem of Picard type (i.e. any sequence of iterations converges to the fixed point) for some kind of contractions, defined in terms of this metric. This metric turned out to be useful in various areas of mathematics, mainly in operator theory.