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Total boundedness and bornologies

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Totally bounded sets with respect to an approximating family of subsets of a metric space are a natural by-product of the study of bornological convergences in the hyperspace.

A bornology in X is a cover of X which is hereditary and closed under finite unions; the usual notion of total boundedness corresponds to the bornology of finite subsets of X.

In the general case, we obtain the families of weakly and strongly totally bounded sets. We will present an analysis of the structure of these two families as well as some applications to mappings that preserve bornologies.