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THE FREUDENTHAL COMPACTIFICATION AS AN INVERSE LIMIT

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Abstract. We describe a construction of the Freudenthal compactification of a locally compact connected space via inverse limits.

Introduction and definitions

A space is called rim–compact if it has a base consisting of open sets B with compact boundary, $\mathrm{bd}(B)$. A subset A of a space X is said to be zero–dimensionally embedded in X, if X has a base consisting of open sets B with $\mathrm{bd}(B) \cap A = \emptyset$. Every rim–compact space X has a compactification Y such that the remainder $Y \setminus X$ is zero–dimensionally embedded in Y. With respect to the usual order of compactifications of X, there is a maximal such compactification, FX, the Freudenthal compactification of X. FX is the unique compactification of X where two closed subsets E and F of X have disjoint closures iff E and F are separated in X by a compact set of X. For the relevant information the reader is referred to the books [3] and [1].

Outside general topology, the Freudenthal compactification has applications in manifold theory, group theory and graph theory. Here the space X is locally compact, σ–compact and connected, sometimes even locally connected, and the points of the *Freudenthal remainder* $FX \setminus X$ are called *ends*. See [4] for some historical comments and definitions.

The quasi–component of a point $x \in X$ is the intersection of all clopen sets of X that contain x. A subset B of X is called bounded if its closure, $\mathrm{cl}(B)$, is compact.

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