The Notion of Slowly Oscillating Functions and Applications to Compactifications

For a discrete countable group G, we say that a function f is slowly oscillating if for every $\epsilon > 0$ and a finite subset F of G containing the identity, there exists a finite subset F' of G such that $\mathrm{diamf(gF)} < \epsilon$ for every $g \in G \setminus F'$. In recent years, these functions have proven to be efficient for studying compactifications. We generalize these functions to slowly oscillating functions in directions of filters and prove an asymptotic counterpart of Urysohn lemma. Also, we prove that for a countable cancellative discrete semigroup S every closed left ideal of $\beta S \setminus S$ is determined by a family of functions that are slowly oscillating in direction of filters.