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The weighted compactification of a group and topological centres

The spectrum of the algebra of LUC (left uniformly continuous) functions on a topological group G is a compact right topological semigroup with the Arens product, called the LUC-compactification of the group, and has topological centre equal to G. In the context of weights and Beurling algebras, the spectrum of the weighted LUC algebra is what we call the weighted LUC-compactification of the group. This compactification is not (in general) a semigroup but its algebraic properties reflect properties of the weight. We study this compactification and use it to find the topological centres of related semigroups and algebras and extend some results of Budak, Işık, and Pym on the existence of small sets which determine the topological centres of the LUC and group algebras to their weighted analogues.