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8. Analysis

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Lifting the Difference Spectrum

In the Banach algebra $A(G)$, where G is a non-discrete locally compact abelian group and $A(G)$ denotes the Gelfand-Fourier transform of $L^1(\widehat{G})$, it is well-known that there are closed subsets $E \subset G$ which are the hulls of distinct closed ideals. Denote the largest such ideal by $I(E)$ and the smallest by $J(E)$. For such *sets of non-synthesis* E, we can investigate the *difference spectrum* $\Delta(E) := \{x \in E : \exists f \in I(E)$ such that there is no neighbourhood U of x on which f coincides with a function in $J(E)$ $\}$. In [1] it was shown that every non-metrizable G contains E such that $\Delta(E)$ is not closed. We discuss this and the related question whether $\Delta(\pi^{-1}(E)) = \pi^{-1}(\Delta(E))$ for a surjective homomorphism $\pi : H \to G$.

[1] D. L. Salinger and J. D. Stegeman, Difference spectra of ideals for non-metrizable groups, J. London Math. Soc. (2), **26** (1982), 531-540.