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Groups with (essentially) one point duals

Let G be a locally compact group and $\widehat{G}$ its dual space of equivalence classes of irreducible unitary representations, which carries the Mackey-Fell topology. In this talk, we consider groups G of the form $A \rtimes H$ with A abelian and H acting on A in such a manner that there exists a $\pi \in \widehat{G}$ with $\{\pi\}$ open and dense in $\widehat{G}$. In this case, π is a square-integrable representation and its matrix coefficient functions satisfy generalized orthogonality relations which lead to an abundance of projections in $L^1(G)$ and transforms on $L^2(A)$ generalizing the continuous wavelet transform of $L^2(\mathbb{R})$. We will focus on presenting examples.