The Generalized Weyl Commutation Relations and Unitarily Affine Invariant Operators

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Abstract. We introduce a concept of unitarily affine invariant operators associated with an arbitrary group $G$ of affine transformations of the real axis and its unitary representation $U$ in a Hilbert space. If $G$ is a continuous, one-parameter group, we show that the unitary representation $U$ and the unitary representation $V$ generated by a self-adjoint unitarily affine invariant operator satisfy generalized commutation relations and establish an analog of the Stone–von Neumann uniqueness result in this case. We also give a complete classification of the pairs of unitarily affine invariant operators $(\hat{A}, A)$ provided that $\hat{A}$ is a symmetric operator with deficiency indices $(1,1)$ and $A$ is its self-adjoint extension.

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