GENERATING HERMITIAN ALGEBRAS FROM NONCOMMUTATIVE GEOMETRY

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Using tools from noncommutative geometry we establish new classes of hermitian convolution algebras associated with groups and groupoids. A group G is said to be hermitian if $L^1(G)$ is a hermitian Banach $*$-algebra, i.e. if every self-adjoint element of $L^1 (G)$ has real spectrum. Understanding which groups are hermitian is an important problem in harmonic analysis with roots in Wiener's lemma. The study of hermitian groups stretched over several decades, culminating in Losert's landmark result in 2001 which established the property for compactly generated groups of polynomial growth. Reframing hermitianness in terms of the study of a derivation on $B(L^2(G))$, we recover Losert's result. We are simultaneously able to show that étale groupoids with polynomial growth are hermitian, thus providing the first examples of hermitian étale groupoids which are not just discrete groups.