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A Hilbert space approach to approximate diagonals for locally compact quantum groups

For a locally compact group G, the unitary operator W on $L^2(G \times G)$ given by $W\xi(x, y) = \xi(x, x^{-1}y)$ encapsulates the structure of G. If G is amenable then one can find simple tensors in $L^2(G) \otimes L^2(G)$ which, when acted upon by W^* produce the square root of an (operator) bounded approximate diagonal for $L^1(G)$.

Using this approximate diagonal for a group algebra as a motivating example, this talk will discuss the relationship between these tensors and approximate identities and approximate translation invariant means. A general approach for approximate diagonals for predual algebras of locally compact quantum groups will be presented.