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Comparing Hilbert module unitaries with Hilbert space unitaries; and multiplicative unitaries.

We show that a A -linear map of Hilbert A -modules is induced by a unitary Hilbert module operator if and only if it extends to an ordinary unitary on appropriately defined enveloping Hilbert spaces. Applications to the theory of multiplicative unitaries compute the equivalence classes of Hilbert modules over a class of C^* -algebraic quantum groups. We develop a theory that for example could be used to show non-existence of certain co-actions.