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Amenable quantum groups are not always unitarizable

A well-known theorem of Day and Dixmier from around 1950 states that if G is an amenable locally compact group, then any uniformly bounded representation of G on a Hilbert space is similar to a unitary representation. In short, amenable groups are "unitarizable". In this talk, I will focus on the question of whether a version of the Day-Dixmier unitarizability theorem holds in the more general framework of locally compact quantum groups. It turns out that the answer to this question is no: In joint work with Sang-Gyun Youn (Seoul National University), we show that many amenable quantum groups (including all Drinfeld-Jimbo-Woronowicz q-deformations of classical compact groups) admit non-unitarizable uniformly bounded representations.