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Title: Fourier transform in the quantum group setting
Abstract: In abstract harmonic analysis, the notion of Fourier transform is defined at the level of abelian locally compact groups, where Pontryagin duality holds. For further generalization, we consider the category of locally compact quantum groups, where Pontryagin-type, self duality holds. Motivated by some recent works by Van Daele in the multiplier Hopf algebra framework, and by using the Haar weights, we can define the (generalized) Fourier transform and the inverse Fourier transform, at the quantum group level. We then consider the analogues of the Fourier inversion theorem, Plancherel theorem, and the convolution product. Along the way, we also obtain an alternative description of the dual pairing map between a quantum group and its dual.