

Adam Skalski

Institute of Mathematics of the Polish Academy of Sciences, Warsaw, Poland

Ami Viselter

Department of Mathematics, University of Haifa, Israel

Convolution semigroups on quantum groups and non-commutative Dirichlet forms

We will discuss convolution semigroups of states on locally compact quantum groups. They generalize the families of distributions of Lévy processes from probability. We are particularly interested in semigroups that are symmetric in a suitable sense. These are proved to be in one-to-one correspondence with KMS-symmetric Markov semigroups on the L^∞ algebra that satisfy a natural commutation condition, as well as with non-commutative Dirichlet forms on the L^2 space that satisfy a natural translation invariance condition. This Dirichlet forms machinery turns out to be a powerful tool for analyzing convolution semigroups as well as proving their existence. We will use it to derive geometric characterizations of the Haagerup Property and of Property (T) for locally compact quantum groups, unifying and extending earlier partial results. If time permits, we will also show how examples of convolution semigroups can be obtained via a cocycle twisting procedure. Based on [1].

References

- [1] A. Skalski and A. Viselter, *Convolution semigroups on locally compact quantum groups and noncommutative Dirichlet forms*, J. Math. Pures Appl., to appear, doi: 10.1016/j.matpur.2018.04.007.