State space of compact quantum groups

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Abstract

Green's relations are of fundamental importance in semigroup theory, as they classify the elements of a semigroup based on the principal ideals they generate. In this presentation, we characterize all Green's equivalence relations on the semigroup of states for the classical compact group and co-commutative compact quantum group, and study the structure of all maximal subgroups within this semigroup. We then extend our analysis to the setting of an arbitrary compact quantum group, characterizing all invertible elements in the associated semigroup. Finally, we investigate the semigroup $S(\mathbb{G}_{\mathbb{G}/\mathbb{H}})$ associated with a normal quantum subgroup $\mathbb{H}$ of a compact quantum group $\mathbb{G} = (C(\mathbb{G}), \Delta)$. This work is a collaboration with Prof. Issan Patri and Dr. Malay Mandal.

References

[1] A. Van Daele. The Haar measure on a compact quantum group. *Proc. Amer. Math. Soc.*, 123(10):3125– 3128, 1995.
[2] Issan Patri. Normal subgroups, center and inner automorphisms of compact quantum groups.
[3] J. A. Green. On the structure of semigroups. *Ann. of Math.* 54(2):163–172, 1951.
[4] J. M. Howie. An introduction to semigroup theory, volume No. 7 of L. M. S. Monographs. Academic Press [Harcourt Brace Jovanovich, Publishers], London-New York, 1976.
[5] J. Yuan. On the groups of units in semigroups of probability measures. *Pacific J. Math.*, 60(2):303– 312, 1975. *Internat. J. Math.*, 24(9):1350071, 37, 2013.
[6] S. L. Woronowicz. Compact matrix pseudogroups. *Comm. Math. Phys.*, 111(4): 613–665, 1987.
[7] S. Wang. Simple compact quantum groups. *I. J. Funct. Anal.*, 256(10):3313–3341, 2009.
[8] U. Franz and A. Skalski. On idempotent states on quantum groups. J. Algebra, 322(5):1774– 1802, 2009.