

SUPPORTS OF MEASURES IN FREE MULTIPLICATIVE CONVOLUTION SEMIGROUPS

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ABSTRACT. Consider a unital C^* -algebra or a von Neumann algebra $\mathcal{A}$ equipped with a positive linear functional $\phi : \mathcal{A} \rightarrow \mathbb{C}$ such that $\phi(1) = 1$. A new type of independence called freeness can be defined by replacing tensor products with free products. This subject parallel to classical probability theory is called free probability theory. Later connections to random matrix theory and other fields in mathematics were established. The free additive convolution, analogous to classical convolution, is a binary operation on the set of probability measures on the real line. The notion of free convolution and multiplicative convolution was introduced by Voiculescu in 1985. It was shown that any probability measure on $\mathbb{R}$ generates a partially defined free convolution semigroup, as proposed by Bercovici and Voiculescu in their study of the free central limit theorem. In this talk, we will talk about the supports of measures in multiplicative semigroups. Some recent progresses in free probability and random matrix theory will be discussed as well.