

# On Free Multiplicative Convolutions

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The free multiplicative convolution was introduced by Voiculescu to describe the multiplication of free positive random variables. This operation is important in the study of free products of certain operator algebras and has found one of its main applications in the theory of large dimensional random matrices. An important analytic tool for computing the free multiplicative convolution of two probability measures is the Voiculescu  $S$ -transform.

The purpose of this talk is to present a review of the  $S$ -transform and an extension to general symmetric probability measures on  $\mathbb{R}$ . Examples of free multiplicative convolutions of probability measures with nonnegative support with symmetric probability measures are presented. In particular we consider multiplicative convolutions of the Wigner and the arcsine distributions with probability measures with nonnegative support, including the positive free stable distribution.

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