

Variance mixture and subordinator in free probability

Noriyoshi Sakuma

Abstract

First, we consider infinitely divisibility of free counterpart of variance mixture of normal distribution. From this problem, we find a class of the freely infinitely divisible distributions that appear as the laws of free subordinators play an important role to investigate infinite divisibility. We call this class free regular infinitely divisible measures. We prove that the class of free regular measures is closed under the free multiplicative convolution, t -th boolean power for $0 < t < 1$, t -th free multiplicative power for $t > 1$ and weak convergence. In addition, we show that a symmetric distribution is freely infinitely divisible if and only if its square can be represented as the free multiplicative convolution of a free Poisson and a free regular measure. This gives two new explicit examples of distributions which are infinitely divisible with respect to both classical and free convolutions: chi-square and $F(1; 1)$ -distribution.