Mathematics > Probability

Fourier and Cauchy-Stieltjes transforms of power laws including stable distributions

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We introduce a class of probability measures whose densities near infinity are mixtures of Pareto distributions. This class can be characterized by the Fourier transform which has a power series expansion including real powers, not only integer powers. This class includes stable distributions in probability and also non-commutative probability theories. We also characterize the class in terms of the Cauchy-Stieltjes transform and the Voiculescu transform. If the stability index is greater than one, stable distributions in probability theory do not belong to that class, while they do in non-commutative probability.

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