QUANTIZATION DIMENSION FOR SOME MORAN MEASURES

MRINAL KANTI ROYCHOWDHURY
DEPT OF MATHEMATICS
THE UNIVERSITY OF TEXAS-PAN AMERICAN

Abstract: The term 'quantization' in the title originates in the theory of signal processing. It is being used by electrical engineers starting in the late 40's. As a mathematical topic quantization for a probability distribution concerns the best approximation of a d-dimensional probability distribution P by a discrete probability with a given number of n-supporting points or in other words, the best approximation of a d-dimensional random vector X with distribution P by a random vector Y with at most n values in its image. The random vector Y which gives the error minimum is called the optimal quantizer of the random vector X and the corresponding error is called the optimal error. The image set of the optimal quantizer is called the optimal set. One of the main goal of quantization theory is to estimate the rate called *Quantization dimension* at which the specified measure of the error goes to zero as n increases. Moran measure is a probability measure defined on a Moran fractal. In this paper, I have determined the quantization dimension function for a Moran measure, and established a relationship between the quantization dimension function and the temperature function of the thermodynamic formalism that arises in multifractal analysis.