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Shuang Shen* (sshen@math.cuhk.edu.hk), Room 233, Lady Shaw Building, The Chinese University of Hong Kong, Shatin, N. T., Hong Kong, Hong Kong. *On the “degree of emptiness of empty sets”*: An interpretation of “latent dimension”. Preliminary report.

A set assigned to a negative fractal dimension is by convention an empty set, while B. B. Mandelbrot in 1980s claimed that simply neglecting this dimension “is a waste of valuable information”. In this talk, a class of inhomogeneous multinomial measures is to be introduced and used as a direct and simple example to give an interpretation of the latent dimension. Such a measure μ is constructed to satisfy an extended multifractal formalism in the sense that, for a certain range of α , the Hausdorff dimension and packing dimension of the α -level set of the local Hölder exponent of μ , taking the entropy-like form, are respectively given by the values of the Legendre transforms of two distinct energy functions (Olsen’s B and b functions) at α . When α is chosen outside its domain, it may happen that the Hausdorff dimension is negative whereas the packing dimension is positive. Following Mandelbrot’s suggestion, we tackle the problem on both geometric and statistical aspects. Methodologically we begin with the computation of the corresponding upper and lower large deviations spectra. (Received September 22, 2015)