Scaling and universality in the micro-structure of urban space

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Abstract

We present a broad, phenomenological picture of the distribution of the length of urban linear segments, l, derived from maps of 36 cities in 14 different countries. By scaling the Zipf plot of l, we obtain two master curves for a sample of cities, which are not a function of city size. We show that a third class of cities is not easily classifiable into these two universality classes. The cumulative distribution of l displays power-law tails with two distinct exponents, $\alpha_B = 2$ and $\alpha_2 = 3$. We suggest a link between our observations and the possibility of observing and modelling urban growth using Levy processes.

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