

Ultrametric spaces and their applications

Branko Dragovich

*Institute of Physics, University of Belgrade; Mathematical Institute
SANU, Belgrade, SERBIA*
[dragovich@ipb.ac.rs]

In ultrametric (non-Archimedean) spaces, distances satisfy strong triangle inequality, $d(x, y) \leq \max\{d(x, z), d(y, z)\}$, instead of the usual one, $d(x, y) \leq d(x, z) + d(y, z)$. From the point of view of Archimedean geometry, ultrametric spaces have some very unusual properties, which turn out to be natural in many applications. There are many examples of ultrametric spaces in mathematics, physics, biology, linguistics and information sciences. Ultrametricity [1] is a particularly appropriate mathematical tool to model and describe the hierarchy and similarity within bioinformation systems. The most advanced examples of ultrametries are related to p -adic numbers [2] and their applications [3].

We will present a review of ultrametric spaces and their applications, in particular in the genetic code [4] and bioinformation systems.

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