



p-Adic Valued Distributions in Mathematical Physics

Andrei Y. Khrennikov



Numbers ... , natural, rational, real, complex, p-adic What do you know about p-adic numbers? Probably, you have never used any p-adic (nonrational) number before now. I was in the same situation few years ago. p-adic numbers were considered as an exotic part of pure mathematics without any application. I have also used only real and complex numbers in my investigations in functional analysis and its applications to the quantum field theory and I was sure that these number fields can be a basis of every physical model generated by nature. But recently new models of the quantum physics were proposed on the basis of p-adic numbers field \mathbb{Q}_p . What are p-adic numbers, p-adic analysis, p-adic physics, p-adic probability? p-adic numbers were introduced by K. Hensel (1904) in connection with problems of the pure theory of numbers. The construction of \mathbb{Q}_p is very similar to the construction of \mathbb{Q} (p is a fixed prime number, $p = 2, 3, 5, \dots, 127, \dots$). Both these number fields are completions of the field of rational numbers \mathbb{Q} . But another valuation $|\cdot|_p$ is introduced on \mathbb{Q} instead of the usual real valuation $|\cdot|$. We get an infinite sequence of non isomorphic completions of \mathbb{Q} : $\mathbb{Q}_2, \mathbb{Q}_3, \dots, \mathbb{Q}_{127}, \dots, \mathbb{R} = \mathbb{Q}_{\infty}$. These fields are the only possibilities to complete \mathbb{Q} according to the famous theorem of Ostrowsky.

- [Pablo VI : el Papa del diA?logo](#)
- [Padagogische Reflexe Auf Die Multikulturelle Gesellschaft in Osterreich](#)
- [Oxford Reading Tree TreeTops Fiction: Level 13 More Pack A: Black Dan](#)
- [Padiatrische Nephrologie](#)
- [P-adic L-functions and P-adic Representations](#)
- [Ozone Protection in Plants : The Potential Use of Chemical Protectants to Measure Atmospheric Oxidant Damage in Alberta Crops](#)