Quantum Physics

Kolmogorov's aporia and solution by construction of a relativized and quantified concept of factual probability

Mioara Mugur-Schachter

(Submitted on 15 Jan 2009 (v1), last revised 10 Feb 2010 (this version, v2))

The crucial but very confidential fact is brought into evidence that, as Kolmogorov himself repeatedly claimed, the mathematical theory of probabilities cannot be applied to physical, factual probabilistic situations because the factual concept of probability is not defined : it is nowhere specified how to construct, for a given physical random phenomenon, the specific numerical distribution of relative frequencies of outcomes from the universe of elementary events produced by that phenomenon, that constitutes the factual probability law to be asserted on this universe; nor is it known what significance to associate to the assertion of mere 'existence' of such a factual probability law. An algorithm of semantic integration of the factual probability law to be asserted in any given factual probabilistic situation, is then constructed. This algorithm, developed inside a general method of relativized conceptualization, involves a quantification of the factual concept of probability. These results, while solving Kolmogorov's aporia, fully organize the general classical concept of probability, both syntactic and factual. As for quantum mechanical 'probabilities', it comes out, surprisingly, that, factually, they cannot be defined in an effective way: fundamental quantum mechanics seems to be confined (observationally and even in principle) to the establishment of only statistical distributions which, as far as finite data can guarantee, are endowed with stability.

Subjects: **Quantum Physics (quant-ph)**
Cite as: **arXiv:0901.2301v2 [quant-ph]**

Submission history

From: Mioara Mugur-Schachter [view email]
[v1] Thu, 15 Jan 2009 16:26:42 GMT (468kb)
[v2] Wed, 10 Feb 2010 10:38:19 GMT (596kb)

Which authors of this paper are endorsers?