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VAK, vacuum fluctuation and the mass spectrum of high energy particle physics. (English)

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Summary: We introduce a fundamental hypothesis identifying quantum vacuum fluctuation with the vague attractor of Kolmogorov, the so-called VAK. This Hamiltonian conterpart of a dissipative attractor is then modelled by $\varepsilon^{(\infty)}$, topology as a "limit set" of a wild dynamics generated by Möbius-like transformation of space. We proceed as follows: First we give an introduction to the $\varepsilon^{(\infty)}$ quantum spacetime theory from the point of view of nonlinear dynamics, complexity, string and KAM theory. Subsequently we give without proof several theorems and conjectures that we consider to be fundamental to the foundation of any general theory for high energy particles interaction. The final picture seems to be a synthesis between compactified Kleinian groups acting on an essentially nonlinear dynamics of a KAM system which enables us to give a very accurate estimation of the mass spectrum of the standard model, and further still we are granted a glimpse into the physics of grand unification as well as quantum gravity. It is concluded that VAK in the infinite dimensions of $\varepsilon^{(\infty)}$ is a valid model for stable quantum states.

MSC:

81R60	Noncommutative geometry in quantum theory
81Q50	Quantum chaos
81V35	Nuclear physics
81T30	String and superstring theories; other extended objects (e.g., branes) in quantum field theory

Keywords:

vague attractor of Kolmogorov; dissipative attractor; Möbius-like transformation of space; quantum spacetime theory; nonlinear dynamics; complexity; string and KAM theory

Full Text: DOI

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