Contribution ID: **9** Type: **2.Parallel session talk**

A Theory of Complex Adaptive Learning Behavior in Complex Adaptive Systems and a Non-Localized Wave Equation in Quantum Mechanics

Tuesday, 24 September 2024 17:30 (30 minutes)

Complex adaptive learning behavior is intelligent. It is adaptive, learns in feedback loops, and generates hidden patterns as many individuals, elements or particles interact in complex adaptive systems (CASs). CASs highlight adaptation in life and lifeless complex systems cutting across all traditional natural and social sciences disciplines. However, discovering a universal law in CASs and understanding the formation mechanism, such as quantum entanglement or complex quantum coherent adaptation, remains highly challenging. Quantifying the uncertainty of CASs by probability waves, the authors explore the inherent logical relationship between Schrödinger's wave equation in quantum mechanics and Shi's trading volume-price probability wave equation in finance. The authors find a non-localized wave equation in quantum mechanics if cumulative observable in a time interval represents momentum or momentum force in Skinner-Shi (reinforcement-frequency-interaction) coordinates. It supports the assumption that a universal law or an invariance of interaction exists in quantum mechanics and finance. The authors conclude that quantum entanglement is a coherent interaction between opposite, adaptive, and complementary forces instead of a superposition of two coherent states that mainstream Copenhagen interprets. The interactively coherent forces generate particles with two opposite properties in a bipartite complex adaptive quantum system, suggesting the second revolution in quantum theory.

Keywords: complex adaptive systems, complex adaptive learning, universal law, non-localized wave equation, interactively coherent entanglement, interactively coherent adaptation
PACS: 89.75.-k (Complex Systems); 89.65.Gh (Economics, Econophysics, Financial Markets, Business and Management); 03.65.Ud (Entanglement and Quantum Nonlocality)

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Session Classification: Parallel 7：Interdisciplinary aspects of few-body physics and techniques

Track Classification: Interdisciplinary aspects of few-body physics and techniques