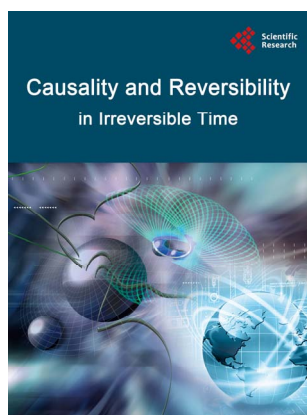


Causality and Reversibility in Irreversible Time: Book Review

M. L. Arushanov

Laboratory of Uzbekistan Hydrometeorological Research Institute, Tashkent, Uzbekistan
Email: mikl-arushanov@rambler.ru

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From classical point of view the full description of a system is the sum of its parties descriptions. Quantum mechanics introduced essential correction in the classical view: the measurable properties of a particle ensemble can exceed the properties sum of its particles. It is impossible to describe such entangled states by the known local field equation. Now nonlocal quantum correlations are well known, they underlie quantum information science and have the practical applications already. On the other hand in macro-physics, in particular, in astrophysics and geophysics a lot of facts about distant dissipative processes correlations (including violating classical causality) not reducible to electromagnetic and gravitation interactions have been collected. These correlations could be explained by their nonlocal nature. Although thermodynamic limit now is already a subject of entanglement research, the mentioned large-scale processes have remained out of scope of quantum information. The book "Causality and Reversibility in Irreversible Time" by S. M. Korotaev is the first attempt to fill this gap.

S. M. Korotaev is the well known physicist, follower of N. A. Kozyrev, working both in the theory and experi-

ment. In his book chapter by chapter, starting from semi-classical Kozyrev causal mechanics, through quantum theory (illustrated by wide series of model entangled states) he approaches to his outstanding experimental results described in the last chapter. On this way, in Chapter 4 the hypothesis, which to be experimentally tested, is formulated as macroscopic entanglement equation, taking into account propositions of causal mechanics, quantum nonlocality and Hoyle and Narlikar action-at-a distance electrostatics.

The Chapter 6 is the main in my opinion. It presents the results of wide and long series of the experiments, conducted under the supervision of S. M. Korotaev, on observation of nonlocal correlations of the distant macroscopic dissipative processes. Most of them are of solar terrestrial scale. The above hypothesis has been successfully tested. The high level of advanced correlations and considerable time shift allowed suggesting and implementing the real and reproducible solar and geomagnetic forecasts. The results are of fundamental importance for basic physics as well as for astrophysics and geophysics. The applied aspect concerning solar-terrestrial physics is also obvious. As an expert in atmospheric physics I have to stress first of all a possibility of the principally new statement of weather and climate forecast problem. The measurements of advanced nonlocal correlation open a way to forecasting a random component of atmospheric activity which is by definition unpredictable in the framework of classical paradigm and namely which, at present, limits the horizon of predictability. In addition, the way to understanding strange observed correlations of the distant processes of different nature opens.

I believe the readers will find the book interesting and stimulating their own reflections and activities.

REFERENCE

- [1] S. M. Korotaev, "Causality and Reversibility in Irreversible Time," Scientific Research Publishing, Inc., Irvine, 2011.

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