

Accepted Manuscript

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Vasily E. Tarasov, Valentina V. Tarasova

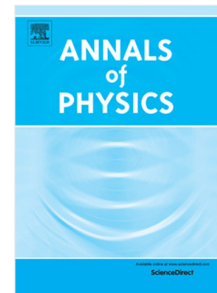
PII: S0003-4916(17)30151-3
DOI: <http://dx.doi.org/10.1016/j.aop.2017.05.017>
Reference: YAPHY 67400

To appear in: *Annals of Physics*

Received date: 28 March 2017
Accepted date: 20 May 2017

Please cite this article as: V. Tarasov, V. Tarasova, Time-dependent fractional dynamics with memory in quantum and economic physics, *Annals of Physics* (2017), <http://dx.doi.org/10.1016/j.aop.2017.05.017>

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**TIME-DEPENDENT FRACTIONAL DYNAMICS WITH MEMORY IN
QUANTUM AND ECONOMIC PHYSICS**

Vasily E. Tarasov,

Skobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University,
Moscow 119991, Russia; E-mail: tarasov@theory.sinp.msu.ru

Valentina V. Tarasova,

Lomonosov Moscow State University Business School,
Lomonosov Moscow State University,
Moscow 119991, Russia; E-mail: v.v.tarasova@mail.ru

Abstract: Fractional dynamics of open quantum systems and sectors of national economies, where the parameters depend on time, are discussed. We show that the quantum and economic processes can demonstrate the same dynamic behavior caused by effects of power-law fading memory. In this paper, we propose generalizations of time-ordered exponential (T-exponential) and time-ordered product (T-product) for processes with power-law memory. The expressions of time-ordered exponential with memory and corresponding generalization time-ordered product are derived by using matrix fractional differential equations. In quantum physics, we consider equations of N-level open quantum system with memory, quantum oscillator with friction and memory. In economic physics (econophysics), we use equations of dynamic intersectoral model with power-law memory, where the matrix of direct material costs and the matrix of incremental capital intensity of production depend on time. The solutions of these equations with derivatives of non-integer orders are suggested.

Keywords: fractional dynamics, process with memory, open quantum systems, econophysics, time-ordered exponent and product, fractional differential equation.

PACS 45.10.Hj Perturbation and fractional calculus methods

PACS 03.65.Yz Decoherence; open systems; quantum statistical methods

PACS 89.65.Gh Economics; econophysics, financial markets, business and management

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