

GEOPHYSICAL TURBULENT FLOWS AND FINANCE FLUCTUATIONS

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We review some of our earlier works, which showed rather clear empirical evidence that financial fluctuations have:

- a behavior, which is incompatible with additive processes, including monofractal additive stochastic models usually introduced in finance, i.e. a Brownian motion, Levy processes and their truncated versions.
- a multifractal behavior, more precisely a universal multifractal behavior.

We discuss the modeling issues related to these findings, such as:

- limitations of the standard Black-Shole model;
- reliability conditions to be respected, when modeling the returns;
- relationships and main differences between space-time Fractionally Integrated Flux (FIF) models and multifractal trading times models.

We finally discuss the fact that market fluctuations could be not only similar to geophysical ones, but also closely related to them. We illustrate that the multifractal framework is very convenient in order to quantify this interrelation.