

## **Complex Dynamics and Hidden Forces in NYSE Stockprices**

V. Alfi, F. Coccetti, M. Marotta, L. Pietronero and M. Takayasu

*Dipartimento di Fisica, Università la Sapienza, 00185 – Roma, Italy; Centro Fermi, Via Panisperna, Roma, Italy; Applied Financial Science, New York, USA; Tokyo Institute of Technology, Yokohama, Japan*

Corresponding author e-mail: [Valentina.Alfi@roma1.infn.it](mailto:Valentina.Alfi@roma1.infn.it)

Recently a new type of complex random walk has been introduced to describe the behavior of currency exchange rates [1]. The basic idea is that the walk is subject to a force which depends on the distance from its own moving average. We have applied this method to the price dynamics of NYSE stocks. the result is quite different from that of currency rates. the effective potential is piecewise linear rather than quadratic and the dynamics is always intrinsically unstable. We propose a model for this behavior and discuss its consequences and implications.

[1] M. Takayasu, T. Mizuno and H. Takayasu, preprint (2005)