MASS EXTINCTIONS AS LOGNORMAL STOCHASTIC PROCESSES

Claudio Maccone(1)

(1)International Academy of Astronautics and Istituto Nazionale di Astrofisica (Italy), Address: Via Martorelli 43, 10155 Torino (TO), phone: +39-345-706-2858,

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ABSTRACT

In a recent paper (ref. [1]), this author investigated a mathematical model representing a Mass Extinction as a lognormal stochastic process in the number of Living Species suddenly undergoing a decrease. Cases of practical interest developed by the author analytically in detail were:

1) The K-Pg mass extinction (“end of dinosaurs”, 65 million years ago) where the mean value decreased like an exponential (“Geometric Brownian Motion”) or like the descending branch of a parabola.

2) The case when the mean value changed in time like a cubic (Markov-Korotayev model of Evolution).

The new, important mathematical feature presented in this paper is the case when the mean value curve of this lognormal process is arbitrary, so that the model may be used to represent mass extinctions of any kind.

We extend the results in [1] for the benefit of simulating future mass extinctions that could be caused by the impact of an asteroid or a comet on Earth.

REFERENCE