

# DETERMINATION OF LYAPUNOV EXPONENTS AND STUDY OF TIME-SERIES GRAPHS ON A NONLINEAR CHAOTIC MODEL

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## ABSTRACT

In this paper, we study the chaotic model:

$$\rho(x) = ax^2 - bx$$

where  $x \in [0, 4]$ ,  $a = -1$  and  $b \in [-1, -4]$  is a tunable parameter and adopt the two techniques (i) Lyapunov Exponents and (ii) Time-series Analysis, in order to confirm the periodic orbits of periods  $2^0, 2^1, 2^2 \dots$ , as the parameter varies in a suitable region and the existence of the chaotic region. Finally some enlightening results have been achieved.

**KEY WORDS:** Lyapunov exponents/ Periodic orbits / Time-series analysis/ Chaotic region

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