

Deterministic chaos in Malkus' Waterwheel

David Becerra Alonso and Valery Tereshko

School of Computing, University of the West of Scotland Paisley PA1 2BE, United Kingdom

David.Becerra.Alonso@uws.ac.uk , Valery.Tereshko@uws.ac.uk

The equations of chaotic waterwheel dynamics are derived through analytical mechanics using the Lagrange approach. Discrete and continuous mass cases are considered, the latter leading to Lorenzian system. The dynamics is showed to be different in these two cases, with discrete mass dynamics matching better the Lorenzian one as the number of buckets increases.

Keywords: Lagrange Approach, Continuous Mass Approximation, Lorenzian Dynamics.