Journal of Applied Probability and Statistics
Vol. 7, No. 1, pp. 19-34
ISOSS Publications 2012

ON THE CLASSIFICATION OF A FIRST ORDER SMOOTH THRESHOLD AUTOREGRESSIVE (STAR) MODEL

Darfiana Nur
School of Mathematical and Physical Sciences, University of Newcastle, NSW 2308, Australia. Email: Darfiana.Nur@newcastle.edu.au
Gopalan M. Nair
School of Mathematics and Statistics, The University of Western Australia, Perth, WA 6009, Australia. Email: gopalan.nair@uwa.edu.au
Nihal D. Yatawara
Department of Mathematics and Statistics, Curtin University of Technology, Perth, WA 6845, Australia. Email: nihal@maths.curtin.edu.au

Summary

This paper establishes a necessary and sufficient condition for recurrence and ergodicity for the general first-order smooth threshold autoregressive processes. Depending on the tail behaviour of the smoothing distribution function, we give necessary and sufficient conditions under which the process is ergodic, null recurrent or transient.

Keywords: Nonlinear time series, Smooth Threshold Autoregressive model, Ergodic, Null recurrent, Transient.

2000 Mathematics Subject Classification: 60E15, 62G15, 62N05.