Invariant distribution of a non linear time series with uniform noise.

J.C.S. de Miranda [1]

[1] Institute of Mathematics and Statistics, University of São Paulo

We prove the existence and uniqueness of the invariant distribution of a non linear autoregressive time series of order one with uniformly distributed independent noise. The non linearity is of square root type. We propose an algorithm to determine this distribution. We prove that this distribution must satisfy a functional integral equation. Transforming this integral equation in a functional differential equation with both delay and scaling we were able to prove the existence of a one parameter infinite class of non negative solutions to the integral equation. Within this class there is only one probability density function.