

A STUDY ON STOCHASTIC INTEGRAL OF A LINEAR BIRTH AND DEATH PROCESS SUBJECTED TO CATASTROPHICAL EVENTS.

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Abstract

Birth and Death processes have been studied very extensively (see Kendall (1948), Bartlett (1955), and Harris (1963), Bailey (1964). Recently such processes have been studied allowing catastrophical events to occur randomly over time decrementing the population size (see Brockwell et al (1982), Pakes (1987), Bartoszynski et al (1989), Buhler and Puri (1989) and Peng et al (1993). In this paper we study the stem from the fact that several biological populations (for example, ungulate populations on sub-arctic islands and populations of grizzly bears in yellowtone Park) exhibit this type of behaviour (for a detailed account of such example, see Hanson and Tuckwell (1987)). Catastrophical events [1] are instantaneous events, each killing some of the members of the population who are present at the time of occurrence of the event.

Key Words : *Birth-death process, Joint moment generating functions, Catastrophical events.*

AMS Subject Classification : 60J27, 60J80.

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