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Computational techniques for inverse problems in size structured stochastic population models. (English) Zbl 0716.93062

Control of partial differential equations, Proc. IFIP Work. Conf., Santiago de Compostela/Spain 1987, Lect. Notes Control Inf. Sci. 114, 3-10 (1989).

[For the entire collection see Zbl 0668.00021.]

This paper is concerned with parameter identification in size structured stochastic population models.

The model discussed is for aquatic populations. It is assumed that the population growth is a Markov transition process, resulting in Fokker- Planck equations for the population model. Specifically the problem tackled is determining the coefficients in the Fokker-Planck equations from observations of population density changes using a least squares formulation. The solution approach involves re-writing the original equations in a variational form using a coercive sesquilinear form. The convergence of the solution is explained briefly with pointers to the references cited in the paper. Two numerical examples are provided.

Reviewer: A.Y.Allidina

MSC:

93E12 Identification in stochastic control theory
93E10 Estimation and detection in stochastic control theory
92D25 Population dynamics (general)

Keywords:

stochastic population models; Markov transition process; Fokker-Planck equations