

Models in population dynamics: from discrete to continuous and back

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Abstract

Populations are always finite, but in many cases they can be quite large. By considering one of the most simple epidemiological model—the SIS—we want to investigate the duality of the two paradigms: discrete and continuous models. We will blend the two models by means of a PDE (cf. [1] that will retain the finite population model behaviour, where still allowing for the use of more analytical techniques that arise in continuous models. As we shall see, the dynamics of such large populations has features from both extreme cases

Keywords: ODEs , Markov Chains, Fokker Planck equations, measure solutions for PDEs.

References

- [1] F.A.C.C. Chalub and M. O. de Souza: Discrete and continuous SIS epidemic models: a unifying approach. *Ecol. Complex.*, 18, 83–95, 2014.