

GRAPHICAL REPRESENTATION OF SOME DUALITY RELATIONS IN STOCHASTIC POPULATION MODELS

Martin Hutzenthaler, *Johann Wolfgang Goethe-Universität Frankfurt, Germany*
Roland Alkemper, *Johannes-Gutenberg Universität Mainz, Germany*

Abstract

We derive a unified stochastic picture for the duality of a resampling-selection model with a branching-coalescing particle process (cf. MR2123250) and for the self-duality of Feller's branching diffusion with logistic growth (cf. MR2308333). The two dual processes are approximated by particle processes which are forward and backward processes in a graphical representation. We identify duality relations between the basic building blocks of the particle processes which lead to the two dualities mentioned above.

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Bibliography

1. Athreya, Siva R.; Swart, Jan M. Branching-coalescing particle systems. *Probab. Theory Related Fields* 131 (2005), no. 3, 376--414. [MR2123250](#) (2006d:60149)
2. Diaconis, P.; Freedman, D. Finite exchangeable sequences. *Ann. Probab.* 8 (1980), no. 4, 745--764. [MR0577313](#) (81m:60032)
3. Donnelly, Peter. The transient behavior of the Moran model in population genetics. *Math. Proc. Cambridge Philos. Soc.* 95 (1984), no. 2, 349--358. [MR0735377](#) (85k:92038)
4. Ethier, Stewart N.; Kurtz, Thomas G. Markov processes. Characterization and convergence. Wiley Series in Probability and Mathematical Statistics: Probability and Mathematical Statistics. *John Wiley & Sons, Inc., New York*, 1986. x+534 pp. ISBN: 0-471-08186-8 [MR0838085](#) (88a:60130)
5. Griffeath, David. Additive and cancellative interacting particle systems. *Lecture Notes in Mathematics*, 724. *Springer, Berlin*, 1979. iv+108 pp. ISBN: 3-540-09508-X [MR0538077](#) (80i:60132)
6. Harris, T. E. Additive set-valued Markov processes and graphical methods. *Ann. Probability* 6 (1978), no. 3, 355--378. [MR0488377](#) (58 #7925)
7. Hutzenthaler, M.; Wakolbinger, A. Ergodic behavior of locally regulated branching populations. *Ann. Appl. Probab.* 17 (2007), no. 2, 474--501. [MR2308333](#)
8. Krone, S.M. and Neuhauser, C. (1997). Ancestral processes with selection. *Theor. Popul. Biol.* 51,3, 210--237.
9. Liggett, Thomas M. Interacting particle systems. *Grundlehren der Mathematischen Wissenschaften [Fundamental Principles of Mathematical Sciences]*, 276. *Springer-Verlag, New York*, 1985. xv+488 pp. ISBN: 0-387-96069-4 [MR0776231](#) (86e:60089)

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