Asymptotics of nearly critical Galton-Watson processes with immigration

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We investigate the inhomogeneous Galton--Watson processes with immigration, where ρ_n the offspring means in the $n^\textrm{th}$ generation tends to 1. We show that if the second derivatives of the offspring generating functions go to 0 rapidly enough, then the asymptotics are the same as in the INAR(1) case, treated by Gy\"orfi et al. We also determine the limit if this assumption does not hold showing the optimality of the conditions.

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