

# CONCENTRATION IN A POPULATION MODEL STRUCTURED IN AGE AND PHENOTYPICAL TRAIT : AN ASYMPTOTIC-PRESERVING SCHEME

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We consider a population structured in age and phenotypical trait, which influences the adaptation of individuals to their environment. The evolution of the population is driven by selection and mutation, as each individual has the trait of his parent, up to small mutations. The population burden on the environment also limits its expansion, and advantages the best-adapted individuals. When considered in a regime of long time and small mutation, and with appropriate hypothesis, the distribution of the population is expected to concentrate at some dominant traits. Dominant traits can also evolve in time, thanks to mutations. From a technical point of view, the concentration phenomenon is described thanks to a Hopf-Cole transform in the model. The asymptotic regime is a constrained Hamilton-Jacobi equation. Because of the lack of regularity of the constraint, it can indeed have jumps, its numerical approximation must be carefully discussed.

We propose and discuss a strategy for the construction of an asymptotic-preserving scheme for the problem transformed with Hopf-Cole. It is based on a formal understanding of the continuous model. The discretization of the limit constrained Hamilton-Jacobi equation will also be discussed.