

## Equilibria of selection-mutation models with small mutation rate

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We consider selection-mutation models for the density of individuals with respect to an evolutionary variable.

We study the relationship between the equilibrium densities and the evolutionarily stable strategies of the underlying pure selection models. More precisely, these equilibrium densities are functions of the evolutionary trait that tend to concentrate at the evolutionarily stable value of the trait when the mutation rate tends to zero.

The technics mainly involve positive semigroup theory and infinite dimensional Perron-Frobenius theorems and take benefit of the special form of the evolution equation, namely,  $u_t = A(E(u))u$ , where  $A(E)$  is the generator of an analytic irreducible positive (linear) semigroup and the nonlinear interaction takes place through a finite dimensional valued “environment”  $E$ .

As an example, an integro-differential equations model for the distribution of individuals with respect to the age at maturity is studied, being this age at maturity the evolutionary trait.

## References

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