

# Long time average of Mean Field Games

Alessio Porretta

Dipartimento di Matematica, Università di Roma Tor Vergata, Italy  
porretta@mat.uniroma2.it

Mean Field Games models, as developed by J.-M. Lasry and P.-L. Lions, describe, roughly speaking, situations with large number of identical agents taking into account in their strategies the mass of the other co-players. Such model gives rise to a coupled system of PDEs, namely a viscous Hamilton-Jacobi equation for the value function of the average player coupled with a Fokker-Planck equation for the density of the players. In this talk we discuss the behavior as the time horizon tends to infinity and the convergence towards a stationary ergodic mean field game, both in case of local and nonlocal coupling in the cost functional. We also prove that convergence holds at exponential rate, and we discuss similar features occurring in the long horizon behavior of a large class of optimality systems.

## *References*

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