

On convergent discretisations of (fractional and local) parabolic Mean Field Games

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We will discuss some recent progress on finite difference type of discretizations of parabolic Mean Field Games (MFGs).

The main novelties are:

1. Numerical approximations:

- Second order in space discretisations for problems with linear diffusions.
- Fractional as well as local diffusions are considered.
- Powers of discrete Laplacians as a numerical method for (fractional) MFGs.

2. Numerical analysis (this part is all new):

- A modified convergence analysis, employing the L^∞ - L^1 duality and a new test-function construction.
- Vacuum is allowed, weak convergence of density in general.
- Convergence under strong convexity OR strong monotonicity.
- Refined regularity results used/proved, weaker assumptions on the data.

This is joint work with I. Chowdhury, R. Ø. Lien, and U. Unneberg.