TRANSPORT AND CONCENTRATION FOR HYPERUNIFORM POINT PROCESSES IN DIMENSION 2

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ABSTRACT. A (stationnary) point process is hyperuniform if the variance of the number of points inside a large window is neglictible with respect to the area of the window when its size goes to infinity. Perturbted lattices, eigenvalues of random matrices, determinantal point processes and zeros of gaussian analytic functions are examples of such processes. They all have in common the fact that the points are more evenly spread out than the ones of a Poisson point process. We will show that the empirical measures of a hyperuniform point process in a window converges towards the intensity measure and we will obtain concentration bounds in Wasserstein distances. The speeed of convergence is optimal and matches the best possible convergence rate in the convergence of atomic measures towards a measure with density.

[Joint work with Sandrine Dallaporta and David Garcia-Zelada, https://arxiv.org/abs/2404.09549]

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