

A family of functional inequalities: Łojasiewicz inequalities and displacement convex functions

Monday, 12 November 2018 09:30 (1 hour)

For displacement convex functionals in the probability space equipped with the Monge-Kantorovich metric we prove the equivalence between the gradient and functional type Łojasiewicz inequalities. We also discuss the more general case of λ -convex functions and we provide a general convergence theorem for the corresponding gradient dynamics. Specialising our results to the Boltzmann entropy, we recover Otto-Villani's theorem asserting the equivalence between logarithmic Sobolev and Talagrand's inequalities. The choice of power-type entropies shows a new equivalence between Gagliardo-Nirenberg inequality and a nonlinear Talagrand inequality. Some nonconvex results and other types of equivalences are discussed.

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