

A Survey of Some Singular Variational Principles

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In this expository talk, I will discuss an interesting singular variational principle introduced by G. Aronsson and explain how its variants are relevant for

- (i) the Monge-Kantorovich mass transfer problem,
- (ii) weak KAM theory in dynamics, and
- (iii) the infinity-Laplacian and associated nonlinear PDE.

As a detailed example, I will introduce a stochastic random turn, tug-of-war game, studied very recently by Peres, Schramm, Sheffield and Wilson, and show its connections with the infinity-Laplacian equation.