Type: Minisymposium Contribution

## **Optimal Control of elliptic PDEs with Wasserstein Regularization**

Tuesday, August 13, 2024 11:00 AM (30 minutes)

We consider an elliptic optimal control problem with a control in the space of regular Borel measures. The Tikhonov regularization term is given by the Wasserstein-*p*-distance ,  $p \in [1, \infty)$ , to a given prior. We establish first-order necessary optimality conditions using the convex subdifferential of the Wasserstein-*p*-distance. These conditions couple the adjoint state with the Kantorovich potential as solution of the dual Kantorovich problem. By employing this coupling, smoothness properties of the optimal control as well as structural properties of its support can be shown depending on the choice of *p*.

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