



The Hong Kong Polytechnic University Department of Applied Mathematics

Colloquium

Fractional semilinar optimal control

By

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Abstract

We adopt the integral definition of the fractional Laplace operator and analyze an optimal control problem for a fractional semilinear elliptic partial differential equation (PDE); control constraints are also considered. We establish the well-posedness of fractional semilinear elliptic PDEs and analyze regularity properties and suitable finite element discretizations. Within the setting of our optimal control problem, we derive the existence of optimal solutions as well as first and second order optimality conditions; regularity estimates for the optimal variables are also analyzed. We devise a fully discrete scheme that approximates the control variable with piecewise constant functions; the state and adjoint equations are discretized with continuous piecewise linear finite elements. We analyze convergence properties of discretizations and derive a priori error estimates.



Date: 22 April 2022 (Friday) Time: 9:30-10:30 (Hong Kong Standard Time GMT +8) Venue: Online Talk via Zoom (Meeting ID: 992 9282 3546) Speaker: Prof. Enrique Otarola, Universidad Técnica Federico Santa María Host: Dr. Buyang Li, The Hong Kong Polytechnic University Click to join: https://polyu.zoom.us/j/99292823546?pwd=eVVRaTJYU3IVbzlZcmVQZEFlcXpTUT09

*** ALL ARE WELCOME ***

For enrolment, please send your name and email to wai-yan.moon@polyu.edu.hk on or before 21 April 2022