

Nonlinear Partial Differential Equations

Boundary value problems and equations arising in fluid mechanics

Approximation of the least Rayleigh quotient for homogeneous functionals

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In this talk, I will discuss two novel methods for approximating minimizers of Rayleigh quotients. The first approximation scheme is based on the method of inverse iteration for square matrices. The second method is based on the large time behavior of solutions of a doubly nonlinear evolution, corresponding to the heat equation in the case of the eigenvalue problem for the Laplace operator. Both schemes have the remarkable property that the Rayleigh quotient is nonincreasing along solutions and that properly scaled solutions converge to an extremal of the Rayleigh quotient. I will focus on concrete examples in Sobolev spaces where our results apply and give some ideas of how our methods work in the general case.

The talk is based on joint work with Ryan Hynd (University of Pennsylvania).