FEW EXAMPLES RELATED TO GENERALIZED CONVEXITY OF POWER FUNCTIONS

OLIVER DRAGIČEVIĆ

We introduce a condition on accretive matrix functions, called p-ellipticity, and discuss its applications to the L^p theory of elliptic PDE with complex coefficients. The examples we present concern:

(1) generalized convexity of power functions (Bellman functions),
(2) dimension-free bilinear embeddings,
(3) L^p-contractivity of semigroups,
(4) holomorphic functional calculus,
(5) regularity theory of elliptic PDE with complex coefficients,
(6) maximal L^p regularity for divergence-form operators with Neumann boundary conditions.

Example (5) is due to Dindoš and Pipher. Example (3) extends earlier theorems by Cialdea and Maz'ya.

The p-ellipticity condition arises from studying uniform positivity of a quadratic form associated with the matrix in question on one hand, and the Hessian of a power function on the other.

The talk is based on joint work with Andrea Carbonaro.