

Abstract:

A notorious obstacle one has to face while working with Stokes-like systems is the presence of the symmetrical gradient in the equations.

The usual methods one would like to apply often cease to work when the full gradient is replaced only with its symmetrical part. A standard tool used to overcome this difficulty is the Korn inequality which allows, under suitable circumstances, to estimate the full gradient by its symmetrical part, in the L^2 space.

In the problem of interest, proving the "natural" regularity of the solution to a certain Stokes-type equation, the classical Korn inequality is no longer a sufficient tool. However, there is an option of using its improved version involving L^p spaces with Muckenhoupt weights. In the eyes of an "application fan", this path probably quickly leads into the realm of orthodox functionalists.

The talk will follow this link between the PDE's and the weighted inequalities theory, discussing a recent result of a joint work with Michael Růžička.