

Abstract:

Testing a PDE with a specific test function, such as the solution itself, is a widely used way of obtaining regularity results. However, some additional properties of the test function are often required. This motivates, for example, the construction of the Bogovski solution to the divergence equation. The point of this talk is to show additional properties of this solution which enable a construction of a specific test function with solenoidal (divergence-free) difference quotients. As an application, one gets a new way to prove interior regularity of the solution to the Stokes system. Despite dealing with a problem of the PDE theory, we will strongly rely on the help of Calderón, Zygmund, Muckenhoupt and Orlicz.