
*Workshop dedicated to the memory of Professor Gabriela Kohr
(2nd edition)*

Geometric Function Theory in Several Complex Variables and Complex Banach Spaces

Cluj-Napoca, Romania

1–3 December 2022

On Spatially-Periodic Solutions of Evolution Anisotropic Stokes, Oseen, and Navier-Stokes Equations

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Abstract

First, we show that the evolution (non-stationary) anisotropic Stokes and generalised Oseen systems with variable viscosity coefficients in a compressible framework can be classified as parabolic systems in the sense of Solonnikov. The solution uniqueness, existence and regularity of these linear PDE systems are analysed in a range of periodic Sobolev (Bessel-potential) spaces in \mathbb{R}^n . Then, employing the Galerkin algorithm, we prove the existence of a global weak solution for the evolution anisotropic variable-coefficient non-linear Navier-Stokes system in a periodic Sobolev space. The solution uniqueness and regularity results are also discussed.