Recent progress in the analysis of the temporal evolution of magnetoviscoelastic materials

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In magnetoviscoelastic systems elasticity is coupled with magnetism. While the former is usually phrased in Lagrangian coordinates, the latter is written up in Eulerian coordinates. Here, we follow an approach in which the coupled system is expressed in Eulerian coordinates [1,2]. The system of partial differential equations consists of the incompressible Navier-Stokes equations, an evolution equation for the deformation gradient as well as the Landau-Lifshitz-Gilbert equation, which describes the dynamics of the magnetization vector. We present the latest state of the art on the analysis of this system including existence of weak and strong solutions as well as corresponding uniqueness results [2].

References

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