Weak solution for a ferrofluid flow model

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SUMMARY

We prove the existence of solution for a model of differential system introduced by Shliomis. It consists of the Navier-Stokes equations, the magnetization equation and the magnetostatic equations, see [3]. The equations describe the stationary flow of an incompressible ferrofluid submitted to the action of an external magnetic field. The external magnetic field induces a demagnetizing field and a magnetic induction. The magnetization equation is of Bloch-Torrey type. We proceed by linearisation and application of Leray-Schauder fixed point Theorem. We give regularity results in L^p-Theory.

Keywords: Ferrofluid, Shliomis, L^p-Theory.

AMS Classification: 35E05, 35Qxx

References

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