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**Existence of global strong solution to the micropolar fluid system in a bounded domain.**

(English) [Zbl 1078.35096](#)

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Summary: We are concerned with the initial boundary value problem of the micropolar fluid system in a three dimensional bounded domain. We study the resolvent problem of the linearized equations and prove the generation of analytic semigroup and its time decay estimates. In particular,  $L^p$ - $L^q$  type estimates are obtained. By use of the  $L^p$ - $L^q$  estimates for the semigroup, we prove the existence theorem of global in time solution to the original nonlinear problem for small initial data. Furthermore, we study the magneto-micropolar fluid system in the final section.

**MSC:**

[35Q35](#) PDEs in connection with fluid mechanics

[76D03](#) Existence, uniqueness, and regularity theory for incompressible viscous fluids

[76A05](#) Non-Newtonian fluids

[76W05](#) Magneto-hydrodynamics and electrohydrodynamics

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**Keywords:**

[micropolar fluid](#); [magneto-micropolar fluid](#); [resolvent estimates](#); [global existence](#); [analytic semigroup](#)

**Full Text:** [DOI](#)

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