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Analyticity of the semi-group generated by the Stokes operator with Navier-type boundary conditions on L^p-spaces

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SUMMARY

We prove here the analyticity of the Semi-group generated by the Stokes operator with Navier-type boundary conditions on L^p-spaces. This analyticity allows us to solve the linearised evolution Navier-Stokes problem with Navier-type boundary conditions

$$\begin{cases} \frac{\partial \boldsymbol{u}}{\partial t} - \Delta \boldsymbol{u} + \nabla \pi = \boldsymbol{f}, & \operatorname{div} \boldsymbol{u} = 0 & \text{in} & \Omega \times (0,T), \\ \boldsymbol{u} \cdot \boldsymbol{n} = 0, & \mathbf{curl}\, \boldsymbol{u} \times \boldsymbol{n} = \mathbf{0} & \text{on} & \Gamma \times (0,T), \\ & \boldsymbol{u}(0) = \boldsymbol{u}_0 & \text{in} & \Omega. \end{cases}$$

Keywords: Analytic semi-group, Stokes operator, Navier-type boundary condition, L^p-spaces,...

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