

New regularity properties of the evolution operator arising from rigid motions, with application to the Navier-Stokes initial value problem

Toshiaki Hishida

Nagoya University, Japan
hishida@math.nagoya-u.ac.jp

Consider a generalized Oseen evolution operator in 3D exterior domains, that is generated by a non-autonomous linearized system arising from time-dependent rigid motions. This was found by Hansel-Rhandi (2014), and then the theory was developed by the speaker (2018,2020), however, desired regularity properties such as estimates of the temporal derivative as well as the Hölder estimates have remained open. The presentation addresses those properties together with weighted estimates of the evolution operator. The results are applied to the Navier-Stokes initial value problem, so that a new theorem on existence of a unique solution locally in time is proved. A part of this talk is based on a joint work with Yosuke Asami (Nagoya).