

**MAXIMAL  $L^p$  REGULARITY OF THE HEAT PROBLEM  
WITH NONHOMOGENEOUS NEUMANN BOUNDARY  
CONDITION AND ITS APPLICATION**

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In this talk, we consider the Neumann problem of the heat equation with nonhomogeneous boundary data and with right-hand side in divergence form. Maximal  $L^p$ -regularity estimate for the generalized solution is derived.

Theorem 1.2 of [2] states that there is  $v \in B_p^{1,1/2}(\Omega \times (0, T))$  which is represented by a single layer potential. Although one believes the result without doubt, any explicit proof is not given in [2].

Weak  $L^p$ -maximal regularity estimate is basically used while we study the parabolic type partial differential equations. In [1], an artificial term, which has not been appeared in the problem with no slip boundary condition, was added in the approximation of the compressible Navier-Stokes equations with inflow condition (Compare the approximating system in section 4.1 of [1] with the one in section 7.4.2 of [3]). Our estimate makes it possible to remove the artificial term even for the problem with inflow condition.

REFERENCES

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