

# Spatial or temporal asymptotics of the Navier-Stokes equations or a type of Keller-Segel-Navier-Stokes equations

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We first consider time periodic solutions for incompressible Navier-Stokes equations with small boundary data in three dimensions. In such case, unique periodic solutions exists and its spatial asymptotic is given by the Landau solutions for all time. Secondly, we discuss coupled system of Keller-Segel type equations and the incompressible Navier-Stokes equations in spatial dimension two. For this model, we show temporal decay estimates of solutions with small initial data and obtain their asymptotic profiles as time tends to infinity.