ON THE CORRECT ASYMPTOTIC CONDITIONS AT INFINITY FOR THE TIME-PERIODIC STOKES PROBLEM IN A SYSTEM OF SEMI-INFINITE PIPES

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Abstract

We consider the time-periodic Stokes problem in domains with cylindrical outlets to infinity. It is well known that this problem may have infinitely many solutions. Prescribing the time-periodic flow rates through the cross-sections of the outlets one can obtain a solution which is unique up to a time-dependent function in its pressure term. We constructed a basis in the set of solutions to the homogeneous problem. The basis possesses several properties that are essential for the setting of asymptotic conditions at infinity (see [1]). We use the generalized Green’s formula in order to specify some asymptotic conditions (different from the prescription of fluxes) which ensure the correct formulation of the problem.

References