On the correct asymptotic conditions at infinity for the time-periodic Stokes problem set in a system of semi-infinite pipes

Mindaugas Skujus
Faculty of Mathematics and Informatics, Vilnius University, Lithuania
Institute of Mathematics, University of Zurich, Switzerland
mindaugas.skujus@mif.vu.lt

We consider the time-periodic Stokes problem set in domains with cylindrical outlets to infinity. It is well known that this problem may have infinitely many solutions. Also it is known that the problem with time-periodic flow rates prescribed through cross-sections of outlets has a solution which is unique up to a time-dependent function in a pressure term. Our aim is to obtain other physically reasonable conditions that lead to a well-posed problem. For this purpose we derive the generalized Green formula which allows us to impose some class of conditions, other than fluxes, that ensures uniqueness of a solution.