

Navier-Stokes flows in pipes

Herbert Amann

Zürich, Switzerland

herbert.amann@math.uzh.ch

Abstract

In recent years non-stationary Navier-Stokes flows in pipes attracted quite a bit of interest. For example, H. Beirão da Veiga [1] established the existence of a time-periodic solution in an infinite straight pipe provided a time-periodic total flux is prescribed. G. Galdi and A. Robertson [2] proved an analogous result for a circular pipe with constant cross section. K. Pileckas [3] studied the non-stationary Navier-Stokes equations in an infinite cylinder for a prescribed total flux. In this talk we discuss fully developed stationary and non-stationary Navier-Stokes flows in curved pipes of variable cross section and arbitrary length. Our results extend, generalize, and considerably simplify the work of those authors.

Keywords: Navier-Stokes equations, curved pipes, Poiseuille flow.

References

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