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**An attempt to construct the Stokes flow
in a domain with cylindrical end**

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Abstract

Based on existence results for the Stokes operator and its solution properties in manifolds with cylindrical ends by N. Große, M. Kohr, V. Nistor and W.L. Wendland, the Stokes flow in a three-dimensional compact domain Ω^+ with a circular opening Σ through which the fluid leaves Ω^+ and enters an unbounded cylindrical pipe. In Ω^+ the Stokes flow is modeled as a mixed boundary value problem whereas in the cylindrical end the velocities and pressure are constant on every straight line in cylindrical direction with initial values from the opening Σ of Ω^+ . These values equal the velocities and pressure obtained from the mixed boundary values's solution in Ω^+ at the opening Σ .