

# Artificial boundary conditions for oscillatory flow past a body

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We consider the time-periodic flow of an incompressible viscous fluid past a body. To make this problem in an unbounded domain accessible for numerical implementations, an artificial boundary is introduced, and corresponding boundary conditions have to be chosen such that the truncated problem approximates the original one. We derive a convergence rate of the truncation error for a suitable choice of boundary conditions, which reflects the far-field behavior of the flow in the exterior domain. The latter is derived from new representation formulas and asymptotic expansions for time-periodic flow.