Solution of stokes flow problem using biharmonic equation formulation and multiquadrics method

Mardanov R., Zaripov S.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© 2016, Pleiades Publishing, Ltd.The biharmonic equation formulation of the Stokes flow problem for multiquadrics method is developed. The main advantage of the approach is the iteration free method to find the solution. The numerical method is applied for the problem of steady incompressible fluid flow past a cylinder in the periodic cell of the Kuwabara model. The comparison with known analytical solution and the analysis of absolute and relative errors show that proposed approach gives satisfactory accuracy. The nonmonotonic dependence of the relative errors on the shape parameter typical for multiquadrics method is observed.

Keywords

Kuwabara model, multiquadrics method, Stokes flow