# Implicit vectorial operator-splitting for three-dimensional incompressible Navier-Stokes equations

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An implicit vectorial operator-splitting difference scheme has been developed for solving the multidimensional incompressible Navier-Stokes equations. A special treatment for the split operators is proposed which leaves the pressure function coupled to one of the velocity components. Thus no artificial boundary conditions are needed for the pressure and the scheme can be fully implicit. Conservative approximations for the advective terms are employed on staggered grids with second order of accuracy. The coordinate splitting reduces in orders of magnitude the computational time in comparison with the implicit schemes employing inversion of the non-split operators. The proposed algorithm is verified through various tests. Some numerical results will be presented.