AN ADDITIVE SCHWARZ PRECONDITIONER FOR THE SPECTRAL ELEMENT OCEAN MODEL FORMULATION OF THE SHALLOW WATER EQUATIONS *

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Abstract. We discretize the shallow water equations with an Adams-Bashford scheme combined with the Crank-Nicholson scheme for the time derivatives and spectral elements for the discretization in space. The resulting coupled system of equations will be reduced to a Schur complement system with a special structure of the Schur complement. This system can be solved with a preconditioned conjugate gradients, where the matrix-vector product is only implicitly given. We derive an overlapping block preconditioner based on additive Schwarz methods for preconditioning the reduced system.

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