

ALGORITHMS FOR FLUX COMPUTING IN VOF-PLIC SOLVERS ON PARALLEL FACILITIES USING ARBITRARY TIME STEPS

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Abstract. Computing fluxes in Volume of Fluid solvers by Piecewise Linear Interface Reconstruction on parallel facilities is a challenging task, particularly when arbitrary time steps are used. The process requires the use of ray tracing techniques to track the swept volumes' edges to the upwind direction potentially crossing inter processor boundaries more than once. This work proposes algorithms to overcome this problem looking for locally conservative advection. A key concept is the correct scheduling of point-to-point non-blocking parallel communication which arises from the swept connectivity. The proposed algorithms are implemented and tested in the OpenFOAM(R) suite. Numerical and implementation details not widely presented in the literature are also shown.