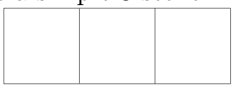
1 Advection of Volume function

Use a simple 3 stencil 1D grid as an example:



1.1 Weymouth-Yue

Original volume plus the boundary flux (Eulerian).

$$\tilde{f}_c = f_c + VOF_c^1 - VOF_c^3 - VOF_r^1 + VOF_l^3 \tag{1}$$

1.2 CIAM

Backward lagrangian of the grid face and find the intersection between two faces (Lagrangian).

$$\tilde{f}_c = VOF_c^2 + VOF_r^1 + VOF_l^3 \tag{2}$$

Compared with W-Y advection, we obtain

$$VOF2_c = f_c - 2VOF_r^1 - VOF_c^1 - VOF_c^3 \tag{3}$$