

Multiphase Flows – WS 2022/23

Problem Session 6 – **Solution:** Interface Tracking (2/3)



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Problem Session 6: Interface Tracking (2/3)

Problem I: Solution

- a) Bilinear interpolation in 2D: consideration of four grid points

$$\begin{aligned}\Phi_f = & \Phi_{i,j} \left(\frac{x_{i+1} - x_f}{\Delta x} \right) \left(\frac{y_{j+1} - y_f}{\Delta y} \right) + \Phi_{i,j+1} \left(\frac{x_{i+1} - x_f}{\Delta x} \right) \left(\frac{y_f - y_j}{\Delta y} \right) \\ & + \Phi_{i+1,j} \left(\frac{x_f - x_i}{\Delta x} \right) \left(\frac{y_{j+1} - y_f}{\Delta y} \right) + \Phi_{i+1,j+1} \left(\frac{x_f - x_i}{\Delta x} \right) \left(\frac{y_f - y_j}{\Delta y} \right)\end{aligned}$$

- b) The complete code has been uploaded to Moodle.
- c) Advection of front particles: $\mathbf{x}_f^{n+1} = \mathbf{x}_f^n + \Delta t \mathbf{u}_f^n$

Problem 2: Solution

a) Distance between front points:

$$\Delta s_{l,l-1} = \sqrt{\left(\frac{x_l - x_{l-1}}{\Delta x}\right)^2 + \left(\frac{y_l - y_{l-1}}{\Delta y}\right)^2}$$

b) The complete code has been uploaded to Moodle.

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Problem 3: Solution

The complete code has been uploaded to Moodle.



Thank you for your attention

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