

Errata

- Sentence just below equation (2.19) should read: *We observe that $c(\theta)$ and $dc(\theta)/d\theta$ are ...*
- \mathcal{C}^1 -approximation of Dirac- δ in table (2.1) should be

$$\delta^1(x) = \begin{cases} 0.9375(x+1)^2(x-1)^2 & -1 < x < 1 \\ 0 & x \leq -1 \text{ or } x \geq 1 \end{cases}.$$

Moreover \mathcal{C}^0 -approximation

$$\delta^0(x) = \begin{cases} -0.75(x+1)(x-1) & -1 < x < 1 \\ 0 & x \leq -1 \text{ or } x \geq 1 \end{cases}$$

was actually used in c_p^{eff} instead of δ^1 .

- All values in table (2.1) are expressed in appropriate SI units:

$$\begin{aligned} [\rho] &= \text{kg m}^{-3}, \\ [c_p] &= \text{J kg}^{-1} \text{K}^{-1}, \\ [L] &= \text{J kg}^{-1}, \\ [M] &= \text{kg mol}^{-1}, \\ [\theta] &= \text{K}, \\ [\kappa] &= \text{W m}^{-1} \text{K}^{-1}, \\ [\mu] &= \text{Pa s}, \\ [x, H^0, \delta] &= 1. \end{aligned}$$

- Equation (2.71) should read

$$\rho \dot{c} = \gamma \left(\frac{3}{2} \frac{\sigma \epsilon}{\rho} \Delta c - 48 \frac{\sigma}{\epsilon \rho} c (c - \frac{1}{2})(c - 1) - \left(\frac{\partial e^B}{\partial c} \right)_{\eta, \nu} \right) \quad (2.71a)$$

and a comment *last term of equation (2.71a) will be specified below* should be added.

- Symbols $\Gamma_{\mathbf{u}}^D$ and Γ_{θ}^D in equations (3.7),(3.9) represents no-slip boundaries and temperature Dirichlet boundaries as given above in original text.
- Equation (3.7) lacks constraint $(u_h)_r|_{\{r=0\}} = 0$.
- Equation (3.19) lacks a commentary that c_p is used instead of c_p^{eff} in convective term by purpose. This was done because of stability issues and probably represents insignificant error.