

Errata for thesis part III

2016-11-11

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$$k^* = \sqrt{\frac{\rho g}{\Gamma}} = 367 \text{ m}^{-1}, \quad \omega^* = \sqrt{2gk^*} = 84.8 \text{ s}^{-1}. \quad (\text{III.1.1})$$

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$$U^S = \begin{cases} U_d + \frac{u_*^2}{\nu} z & z \geq -5 \frac{\nu}{u_*}, \\ U_d + 5u_* + \frac{u_*}{\kappa} (\alpha - \tanh \frac{\alpha}{2}) & z < -5 \frac{\nu}{u_*}, \end{cases} \quad (\text{III.2.17})$$

$$\sinh \alpha = 2\kappa \frac{u_*}{\nu} (z \geq -5 \frac{\nu}{u_*}). \quad (\text{III.2.18})$$

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$$u'_{BL} \sim \bar{\omega} a, \quad w'_{BL} \sim \mu \bar{\omega} a, \quad \frac{p'_{BL}}{\rho'} \sim \epsilon \frac{\bar{\omega}^2}{k} a. \quad (\text{III.3.17})$$

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Last line of first paragraph: “interior components are unindexed.”

$$\frac{p'}{\rho'} \rightarrow \frac{\bar{\omega}^2}{k} \epsilon p'_T = \frac{\bar{\omega}^2}{k} (\epsilon p' + \epsilon^2 p'_{BL}), \quad (\text{III.4.7})$$

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Second line in equation (III.4.34):

$$- \frac{\partial \eta}{\partial x} \frac{\partial^2 \psi}{\partial t \partial x} \Big) \epsilon^2 \left(\eta \frac{\partial \psi}{\partial x} \frac{\partial^2 U^S}{\partial z^2} + \frac{\partial \eta}{\partial x} \frac{\partial^2 \psi}{\partial x^2} U^S - \eta \frac{\partial^3 \psi}{\partial x \partial z^2} U^S + \eta \frac{\partial \psi}{\partial x} \frac{\partial^3 \psi}{\partial z^3} + \sigma^2 \frac{\partial^3 \psi}{\partial z^3} \right.$$

Last line in equation (III.4.34):

$$\text{delete the first term} - \frac{1}{2} \left(\frac{\partial \eta}{\partial x} \right)^2 \frac{\partial^3 \eta}{\partial x^3} - \frac{\partial \eta}{\partial x} \left(\frac{\partial^2 \eta}{\partial x^2} \right)^2 + \frac{\partial N}{\partial x} \Big) = \mathcal{O}(\epsilon^3) \quad \text{at} \quad \begin{cases} z = 0, \\ \bar{z}_{BL} = 0. \end{cases} \quad (\text{III.4.34})$$

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$$\psi = \psi_1 + \epsilon \psi_2 + \epsilon^2 \psi_3 + \dots, \quad (\text{III.4.40})$$

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$$\begin{aligned}\hat{\psi}_{2,k} = & \left(2ke^{-kz} \int_{-\infty}^{\boxed{z}} e^{2k\xi} U^S(\xi) d\xi - U^S(z)e^{kz} \right) \mathcal{A} - i \left(\frac{\omega}{k} z + \frac{k^2 - 2}{6k\omega} \right) \frac{\partial \mathcal{A}}{\partial x_1} e^{kz} \\ & + \frac{k^2 + 2}{3\omega} \hat{\eta}_{2,k} e^{kz},\end{aligned}\quad (\text{III.5.21})$$

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$$\frac{\partial^2 \psi_{BL}}{\partial z_{BL}^2} = \frac{\partial^2 \psi_1}{\partial x^2} - \frac{\partial^2 \boxed{\psi_1}}{\partial z^2} + \epsilon \mu^{-1} T \quad \text{at} \quad \begin{cases} z = 0, \\ \bar{z}_{BL} = 0. \end{cases} \quad (\text{III.5.25})$$

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$$\begin{aligned}\hat{\psi}_{2,1} = & \left(2e^{-z} \int_{-\infty}^{\boxed{z}} e^{2\xi} U^S(\xi) d\xi - U^S(z)e^z + \delta z e^z - \frac{1}{6} \delta e^z \right) A - 2A^* B e^z \\ & + \hat{\eta}_{2,1} e^z,\end{aligned}\quad (\text{III.6.17})$$

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$$F_{2,2} = U^S(0)B + \delta B + A^2 - \boxed{\frac{1}{2}} i \frac{\partial B}{\partial t_1}, \quad (\text{III.6.19})$$

$$\begin{aligned}\hat{\psi}_{2,2} = & \left(4e^{-2z} \int_{-\infty}^{\boxed{z}} e^{4\xi} U^S(\xi) d\xi - U^S(z)e^{2z} + 2\delta z e^{2z} + \frac{1}{6} \delta e^{2z} \right) B - \frac{3}{4} A^2 e^{2z} \\ & + \hat{\eta}_{2,2} e^{2z},\end{aligned}\quad (\text{III.6.22})$$

First line after subsection III.6.3: “The boundary layer problem is identical to that given for ...”