Errata-Corrige-Addenda-Variationes to the book
"*Foundations of fluid mechanics*" **(Second printing)**, by G. Gallavotti

Note:
l. 2 means line 2 (from top of page);
l. -3 means line 3 from bottom of page
action to be taken for correction is typed in bold face

Corrections to the second printing (page numbers of the second ed.)

• line 3 before [1.1.4]: if $f(\underline{w}) = e^{\frac{-m\underline{w}^2}{2k_BT}}(\frac{m}{2\pi k_BT})^{3/2}$ **should be** where $\tau = \lambda/\overline{v}$ is the free flight time, if $f(\underline{w}) = e^{\frac{-m\underline{w}^2}{2k_BT}}(\frac{m}{2\pi k_BT})^{3/2}$

• p. 31: l. -9: [Eb77] **should be** [Eb77],[Eb82]

• p. 42: l. 14: $\frac{M_L}{M_T}\Big(\frac{3}{2}\alpha^2+$ **should be** $\Big(\frac{M_L}{M_T}\frac{3}{2}\alpha^2+$

• Sec. 1, problem [1.1.5]: add call to index for "Clausius–Maxwell relation"

• p.111, delete text in parenthesis after Eq. (2.2.38).

• p. 166: l. 1 after (3.2.17): It also satisfies **should be** (iii) It also satisfies

• p. 167: l. 4 after (3.2.19) **delete** Property (iv), evident for $\underline{\gamma}^R(t)$, is proved in the same way.

• p. 167: l. 6 in remark 2: (1.3.16) **should be** (3.2.16)

• p. 168: l.1 after (3.2.22): the first term in (3.2.9) as $|\underline{\gamma}^0_{\underline{k}}|e^{-\underline{k}^2\nu t} \le C^0_{\alpha+\eta}\,|\underline{k}|^{-\alpha-\eta}$ **should be** the first and second terms in (3.2.9) by $|\underline{\gamma}^0_{\underline{k}}| + \frac{|\underline{\varphi}_{\underline{k}}|}{\nu\underline{k}^2} \le C^0_{\alpha+\eta}\,|\underline{k}|^{-\alpha-\eta}$

• p. 169: l. 4,5 in remark 1: to the initial datum (*i.e.* $|\gamma^0_{\underline{k}}|\,|\underline{k}|^\alpha \le C^0_\alpha$) **should be** to the initial datum and the forcing (*i.e.* $(|\gamma^0_{\underline{k}}|+\frac{|\underline{\varphi}_{\underline{k}}|}{\nu\underline{k}^2})\,|\underline{k}|^\alpha, \le C^0_\alpha$)

• p. 169: l. 2 and 4 in remark 3: C^0_α **should be** $\overline{C}^0_\alpha$

• p. 169: in (3.2.23): **add** $+\frac{|\underline{\varphi}_{\underline{k}}|}{\nu|\underline{k}|^2}$ in the first and second line **and add** $+\max\frac{|\underline{k}|^{\alpha+\eta}||\underline{\varphi}_{\underline{k}}|}{\nu|\underline{k}|^2}$ in the third line.

• p. 170: l. 2 after (3.2.27): (2.2.26) **should be** (3.2.25)

• p. 174: l. 11 in remark 1: $\underline{\gamma}(t)$ **should be** $\underline{\gamma}_{\underline{k}}(t)$

• p. 175: l. 4 in remark: in general **should be** ,in general,

• p. 183: l. 1 in Proposition 1:
There **should be** Let $\underline{u}^0, \underline{g} \in C^\infty(\Omega)$. There

• p. 183: l. 1 after (3.3.14): $t \in [0, T_0]$ **should be** $t \in [t_0, t_0 + T_0]$

• p. 185: l. 1 after (3.3.25): $\nu t \leq L^2$ **should be** $\nu(t - t_0) \leq L^2$

• p. 186: l. 1 before (3.3.30): rmemark **should be** remark

• p. 188: l. 5 after (3.3.36): $|||\underline{k}|\,(\underline{\gamma}^1 - \underline{\gamma}^2)||_2$ **should be** $|||\underline{k}|\,(\underline{\gamma}^1 - \underline{\gamma}^2)||_2^2$

• p. 189: l. 4 in Definition 2: **delete** or "L-weak solutions"

• p. 189: l. 2 after (3.3.42): $\mathcal{E}^0_n \stackrel{def}{=} \tilde{\mathcal{E}}_n \supset \cup_{t\in\mathcal{E}_n}(t, t + \tau_n)$ **should be** $\mathcal{E}^0_n \stackrel{def}{=} \cup_{t\in\mathcal{E}_n}\,(t, t + \tau_n)$

• p. 190: l. 1 before Proposition 4: corollary **should be** corollary, where $\nu = 1$ for simplicity,

• p. 196: l. 7 after (3.3.61): by integration by parts. **should be** because of the periodicity of the $\underline{y}$ integration.

• p. 196, l. 1 before Bibliography: majorizations). **should be** majorizations. In a similar way one can check that the derivative is continuous).)

• p. 201, l. -1: in question **should be**
in question, see Proposition II in Sect. §3.3 and remark (2) following it,

• p. 202: (3.4.16) **should be**

$$\underline{x} \in S(\underline{x}, r) \qquad \text{and} \qquad t \in (\vartheta, \vartheta + T_{cr} \min(1, \frac{F}{R_r^4 + R_{gr}^2})) \qquad (3.4.16)$$

• p. 202, l. 2: **delete l. 2, completely**

• p. 202, l. -1: $\underline{x} \times \left(\vartheta_i, \vartheta_i + \frac{r_i^2}{\nu}\frac{F}{2\varepsilon^2}\right)$ **should be** $\underline{x} \times (\vartheta_i, \vartheta_i + \frac{r_i^2}{\nu})$

• p. 225, in problem [3.5.14]: **delete the entire hint**

• appendix to Sec. (5.5): add in theorem I' end of (ii) a reference to the index for the item "dynamical base"

• p. 420: $\underline{k}_1 + \underline{k}_2 = -\underline{k}_3$ **should be** $\underline{k}_3 + \underline{k}_2 = -\underline{k}_1$

• p.428: **in problem [6.2.5] in formula (!) missing** $+\partial_\gamma V_{\gamma\beta,\alpha}(\underline{r}) + \langle u_\alpha(\underline{x}) g_\beta(\underline{x} + \underline{r})\rangle$

• p.429: in problem [6.2.5]: various rows **should be** second and third rows.

• p.429: **in problem [6.2.7] replace:** [6.2.4] **by** [6.2.6] **and** [6.2.2] **by** [6.2.4] **and** (6.2.9) **by** Eq. (6.2.9)

• p.429: **add hint to problem [6.2.8] as:** (*Hint:* See following problem).

• p.429: **in problem [6.2.9]: add before** $3C + 2D + E = 0$ **the extra relation** $2D' - 2\frac{D}{\rho} + E' = 0$

• p.429: **in problem [6.2.9]: add at the end of the hint** The relations imply $3C = -2D$, $E = 0$, and $B_{rrr} = -12C$, $V_{\gamma\alpha,\alpha} = -5\frac{C}{\rho}$: $\Rightarrow$, by [6.2.7], $B_{rrr} = \frac{4}{5}\varepsilon\rho$.

• p. 498: **add reference:**

[Eb77] **Ebin, D.G.**: *The Motion of Slightly Compressible Fluids Viewed as a Motion With Strong Constraining Force*, Annals of Mathematics, **105**, 141–200, 1977.

- p. 500, Ref [EM94]: 981 **should be** 981-1004