

FRACTIONAL CALCULUS AND WAVES IN LINEAR VISCOELASTICITY

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ERRATA CORRIGE (March 2011)

Cuiusvis hominis est errare, nullius nisi insipientis in errore perseverare.
Marcus Tullius Cicero (*Oratio Philippica Duodecima*).

Thanks to all those who send corrections or detect typos and omissions! This will prove highly valuable in preparing the next edition/printing.

- **p. 17, Ch. 1.** I. Liouville, I. Hadamard, I.E. Littlewood, I Spanier would read: J. Liouville, J. Hadamard, J.E Littlewood, J. Spanier.

- **p. 31, Ch. 2.** $G(t) \equiv G_g \equiv G_e = 1/m$ would read $G(t) \equiv G_g \equiv G_e = m$.

- **p. 60, Ch. 3.** In the RHS of Eq. (3.11) $s^{1-\nu}$ would be replace by $1/s^{1-\nu}$, namely:

$$\delta(t) \div 1 \Rightarrow \frac{t^{-\nu}}{\Gamma(1-\nu)} \div \frac{1}{s^{1-\nu}}, \quad (3.11)$$

- **p. 62, Ch. 3.** The R.H.S of Eq. (3.20a) must read as follows:

fractional anti-Zener model :

$$\left[1 + a_1 \frac{d^\nu}{dt^\nu} \right] \sigma(t) = \left[b_1 \frac{d^\nu}{dt^\nu} + b_2 \frac{d^{(\nu+1)}}{dt^{(\nu+1)}} \right] \epsilon(t), \quad (3.20a)$$

- **p. 154, Ch. 6.** Footnote 3: tuentieth would read twentieth

- **p. 163, App. A.** Eq. (A.23) would read:

$$\int_0^\infty e^{-zt^\mu} t^\nu - 1 dt = \frac{1}{\mu} \frac{\Gamma(\nu/\mu)}{z^{\nu/\mu}} = \frac{1}{\nu} \frac{\Gamma(1 + \nu/\mu)}{z^{\nu/\mu}}, \quad (A.23)$$

- **p. 223, App. E.** In the RHS of Eq. (E.45) β must be replaced by β^n , namely:

$$\mathcal{E}_\alpha(\beta, t) := t^\alpha \sum_{n=0}^{\infty} \frac{\beta^n t^{n(\alpha+1)}}{\Gamma[(n+1)(\alpha+1)]}, \quad t \geq 0. \quad (E.45)$$

- **p. 226, App. E.** In the LHS of Eq. (E.66) γ must be replaced by $-\gamma$, namely:

$$(1+z)^{-\gamma} = \sum_{n=0}^{\infty} \frac{\Gamma(1-\gamma)}{\Gamma(1-\gamma-n)n!} z^n = \sum_{n=0}^{\infty} (-1)^n \frac{\Gamma(\gamma+n)}{\Gamma(\gamma)n!} z^n. \quad (E.66)$$

- **p. 226, App. E.** Eq. (E.68) would read:

$$e_{\alpha,\beta}^\gamma(t; \lambda) := t^{\beta-1} E_{\alpha,\beta}^\gamma(-\lambda t^\alpha) \text{ CM iff } \begin{cases} 0 < \alpha, \beta, \gamma \leq 1 \\ \alpha \gamma \leq \beta. \end{cases} \quad (E.68)$$

- **p. 252, App. F.** In the first line of Eq. (F.34) insert in the Fourier integral $\exp i\kappa x$, namely:

$$\begin{aligned} \mathcal{F} \left[\frac{1}{2} M_\nu(|x|) \right] &:= \frac{1}{2} \int_{-\infty}^{+\infty} e^{i\kappa x} M_\nu(|x|) dx \\ &= \int_0^\infty \cos(\kappa x) M_\nu(x) dx = E_{2\nu}(-\kappa^2). \end{aligned} \quad (F.34)$$

- **p. 253, App. F.** Eq. (F.36) would read

$$L_\alpha^\theta(x, t) \div \exp \left[-t\psi_\alpha^\theta(\kappa) \right] \iff L_\alpha^\theta(x, t) = t^{-1/\alpha} L_\alpha^\theta(x/t^{1/\alpha}), \quad (F.36)$$

-**p.262, Bibliography.** In the references Agrarwal (2000), (2001, (2002), (2003) you would read: Agrawal

- **p.272, Bibliography.** In the reference after Butzer, P.L., Kilbas, A.A., and Trujillo, J.J. (2003), which appears without authors, you would add: Butzer, P.L. and Westphal, U. (1975).

- **p. 279, Bibliography.** The reference Debnath, L. (2003b) would read: Debnath, L. (2003b). Recent developments in fractional calculus and its applications to science and engineering, *Internat. Jour. Math. and Math. Sci.* **54**, 3413–3442.

- **p. 292, Bibliography.** Before Gorenflo, R. and Rutman, R. (1994) add the reference:

Gorenflo, R., Mainardi, F. and Srivastava, H.M. (1998). Special functions in fractional relaxation-oscillation and fractional diffusion-wave phenomena, in Bainov, D. (Editor), *Proceedings VIII International Colloquium on Differential Equations, Plovdiv 1997*, VSP (International Science Publishers), Utrecht, pp. 195–202.

- **p. 346, Index.** Riemann-Liouville fractional integral, 2,230 in only one line.