FRACTIONAL CALCULUS AND WAVES IN LINEAR VISCOELASTICITY

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ERRATA CORRIGE (December 2010)

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:

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

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

$fractional \quad anti-Zener\,model\;:$

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

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

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

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

- **p. 209, App. D**. In the Laplace transform pair (D.24) the parameter a could be 1, so Eq. (D.25) would read:

$$\nu(t,a) := \int_0^\infty \frac{t^{a+\tau}}{\Gamma(a+\tau+1)}\, d\tau\,, \quad a \ge -1\,. \qquad (D.25)$$

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

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

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

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

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

$$e^{\gamma}_{\alpha,\beta}(t;\lambda) := t^{\beta-1}\, E^{\gamma}_{\alpha,\beta}\,(-\lambda t^\alpha)\ \mathrm{CM\ iff} \begin{cases} 0<\alpha,\beta,\gamma\le 1 \\ \alpha\,\gamma \le \beta\,. \end{cases} \qquad (E.68)$$

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

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

-**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.