Corrigenda

On Thermodynamics and Thermostatistics of Viscous Thermoelastic Solids in Electromagnetic Fields. A Lagrangian Formulation

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Due to a slip in calculation, certain formulas assume a slightly different form. No essential results change, however. The error occurred because a wrong identity for the Jacobian J of the deformation gradient $F_{i\alpha}$ was used. The identity should read $\varepsilon_{ijk} = J \varepsilon_{\alpha\beta\gamma} F_{\alpha i}^{-1} F_{\beta j}^{-1} F_{\gamma k}^{-1}$. The first formula that changes is (2.30) in which the Maxwell-Lorentz aether relations are listed. These formulas now read

$$(2.30 \text{ N}) \quad \begin{aligned} \mathbb{D}_\alpha &= \varepsilon_0 |J| \{ C_{\alpha\beta}^{-1} \mathbb{E}_\beta - \varepsilon_{\gamma\delta\varepsilon} C_{\alpha\beta}^{-1} F_{\delta j}^{-1} \dot{x}_j \mathbb{B}_\varepsilon \}, \\ \mathbb{H}_\beta &= \frac{1}{\mu_0 |J|} C_{\alpha\beta} \mathbb{B}_\alpha. \end{aligned}$$

Similarly, the body force $\rho_0 f_i$ in (3.17) assumes a simpler form

$$(3.17 \text{ N}) \quad \begin{aligned} \rho_0 f_i &= \{ \mathbb{Q}^F \mathbb{E}_\alpha + \varepsilon_{\alpha\beta\gamma} \mathbb{J}_\beta^F \mathbb{B}_\gamma \} F_{\alpha i}^{-1} - \varepsilon_{\alpha\beta\gamma} F_{\alpha i}^{-1} \mathbb{B}_\beta \mathbb{P}_\gamma - \mathbb{P}_{\alpha,\alpha} F_{\beta i}^{-1} \mathbb{E}_\beta \\ &\quad + F_{\mu i}^{-1} (\mathbb{B}_\delta \mathbb{M}_{\mu,\delta} - \mathbb{B}_\delta \mathbb{M}_{\delta,\mu}) + F_{vi,\mu}^{-1} \mathbb{B}_\mu \mathbb{M}_v - F_{k\delta} F_{\mu i}^{-1} F_{vk,\mu}^{-1} \mathbb{B}_\delta \mathbb{M}_v. \end{aligned}$$

Finally, the jump conditions for momentum and energy now become

(i) for the momentum equation

$$(3.25 \text{ N}) \quad \begin{aligned} F_i &= \rho_0 v_i + \varepsilon_{\alpha\beta\gamma} F_{\alpha i}^{-1} \mathbb{D}_\beta \mathbb{B}_\gamma, & \text{momentum density for matter and field,} \\ \Psi_{i\alpha} &= -T_{i\alpha} - F_{\beta i}^{-1} (\mathbb{D}_\alpha \mathbb{E}_\beta + \mathbb{B}_\alpha \mathbb{H}_\beta) - \varepsilon_{\gamma\delta\varepsilon} F_{\gamma i}^{-1} F_{\delta l}^{-1} \dot{x}_l (\mathbb{B}_\varepsilon \mathbb{D}_\alpha - \mathbb{B}_\alpha \mathbb{D}_\varepsilon) \\ &\quad - \varepsilon_{\mu\beta\gamma} F_{\mu i}^{-1} F_{\alpha j}^{-1} \dot{x}_j \mathbb{B}_\gamma \mathbb{D}_\beta \\ &\quad + \frac{1}{2} \{ F_{\alpha i}^{-1} (\mathbb{E}_\beta \mathbb{D}_\beta + \mathbb{H}_\beta \mathbb{B}_\beta) - \varepsilon_{\gamma\delta\varepsilon} F_{\alpha i}^{-1} F_{\delta l}^{-1} \dot{x}_l (\mathbb{B}_\varepsilon \mathbb{D}_\gamma - \mathbb{B}_\gamma \mathbb{D}_\varepsilon) \}, \\ & & \text{momentum flux for matter and field,} \end{aligned}$$

(i) for the energy equation

$$(3.26 N) \quad F = \rho_0 \left(\varepsilon + \frac{\dot{x}^2}{2} \right) + \frac{1}{2} \{ (\mathbf{I} \mathbf{E}_\alpha \mathbf{I} \mathbf{D}_\alpha + \mathbf{I} \mathbf{H}_\alpha \mathbf{I} \mathbf{B}_\alpha) - \varepsilon_{\alpha\beta\gamma} F_{\beta l}^{-1} \dot{x}_l (\mathbf{I} \mathbf{D}_\alpha \mathbf{I} \mathbf{B}_\gamma - \mathbf{I} \mathbf{B}_\alpha \mathbf{I} \mathbf{D}_\gamma) \}$$

energy density of matter and field,

$$\begin{aligned} \Psi_\alpha = & q_\alpha - T_{j\alpha} \dot{x}_j + J^2 \varepsilon_{\beta\gamma\delta} C_{\alpha\beta}^{-1} C_{\gamma\varepsilon}^{-1} \mathbf{I} \mathbf{E}_\varepsilon \mathbf{I} \mathbf{H}_\delta \\ & - J^2 \varepsilon_{\beta\gamma\delta} \varepsilon_{\mu\nu\xi} C_{\alpha\beta}^{-1} C_{\gamma\mu}^{-1} F_{\nu m}^{-1} \dot{x}_m \mathbf{I} \mathbf{B}_\xi \mathbf{I} \mathbf{H}_\delta + J^2 \varepsilon_{\beta\gamma\delta} \varepsilon_{\sigma\lambda\psi} C_{\alpha\beta}^{-1} C_{\delta\sigma}^{-1} F_{\lambda m}^{-1} \dot{x}_m \mathbf{I} \mathbf{E}_\gamma \mathbf{I} \mathbf{D}_\psi \\ & - J^2 \varepsilon_{\beta\gamma\delta} \varepsilon_{\mu\nu\xi} \varepsilon_{\sigma\lambda\psi} C_{\alpha\beta}^{-1} C_{\gamma\mu}^{-1} C_{\delta\sigma}^{-1} F_{\nu m}^{-1} F_{\lambda q}^{-1} \dot{x}_m \dot{x}_q \mathbf{I} \mathbf{B}_\xi \mathbf{I} \mathbf{D}_\psi \\ & + \frac{\dot{x}_i}{2} \{ F_{\alpha i}^{-1} (\mathbf{I} \mathbf{E}_\beta \mathbf{I} \mathbf{D}_\beta + \mathbf{I} \mathbf{B}_\beta \mathbf{I} \mathbf{H}_\beta) - F_{\alpha i}^{-1} (\mathbf{I} \mathbf{D}_\beta \mathbf{I} \mathbf{B}_\delta - \mathbf{I} \mathbf{B}_\beta \mathbf{I} \mathbf{D}_\delta) \varepsilon_{\beta\gamma\delta} F_{\gamma l}^{-1} \dot{x}_l \} \end{aligned}$$

energy flux of matter and field.

The above changes imply corresponding changes in the intermediate formulas (4.3) and (4.5)–(4.12) which are easily identified. I delete these corrected identities, because they are of intermediate interest only and do not affect the main result, equation (4.20), or any one of the following formulas in the remainder of the paper.

The footnote on page 345 should read: The Lagrangian polarization introduced here is the same as TOUPIN's [11].

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