

Erratum to: A poroplastic model of structural reorganisation in porous media of biomechanical interest

Original

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Erratum to:
“A poroplastic model of structural reorganisation in porous media of biomechanical interest”,
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1 We would like to perform the following corrections to our paper [1].

2 **Correction to Sect. 3**

3 In Eq. (11b), $I_1(\mathbf{C}_e)$ should be replaced with $\hat{I}_1(\mathbf{C}_e)$. Thus, the corrected
4 equation reads

$$I_2 = \hat{I}_2(\mathbf{C}_e) = \frac{1}{2} \left\{ [\hat{I}_1(\mathbf{C}_e)]^2 - \text{tr}[(\boldsymbol{\eta}^{-1} \mathbf{C}_e)^2] \right\} = \frac{1}{2} \left\{ I_1^2 - \text{tr}[(\mathbf{B}_p \mathbf{C})^2] \right\}, \quad (11b)$$

5 **Corrections to Sect. 4**

6 1. In the sentence starting one line after Equation (63c) with “In particular,
7 ...”, and ending with Equation (65), the wording “acoustic tensor” is
8 incorrect and should be replaced with “first elasticity tensor”. Accordingly,
9 the corrected text should read as reported below:

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10 “In particular, $\mathbb{A}_{n,k-1,l-1}^{\text{sc}}$ is the constitutive part of the first elas-
 11 ticity tensor computed at the l th iteration in \mathbf{B}_{pn} and at the k th
 12 iteration in p_n and χ_n , i.e.

$$\mathbb{A}_{n,k-1,l-1}^{\text{sc}} = \frac{\partial \hat{\mathbf{P}}_{\text{sc}}}{\partial \mathbf{F}}(\mathbf{F}_{n,k-1}, \mathbf{B}_{pn,l-1}), \quad (64)$$

13 while $\mathbb{L}_{n,k-1,l-1}$ is a fictitious elasticity tensor, introduced by the
 14 algorithm, and induced by the Gâteaux derivative of the functional
 15 \mathfrak{L} with respect to the deformation [cf. (58)], i.e.

$$D_{\chi} \mathfrak{L}(A_{n,k-1,l-1})[\mathbf{h}_{n,k}] := \int_{\mathcal{C}_R} \mathbf{g} \text{Grad } \tilde{\mathbf{u}} : \mathbb{L}_{n,k-1,l-1} : \mathbf{H}_{n,k} \cdot \quad (65)$$

- 16 2. In the text starting one line after Equation (65) with “It is important . . .”
 17 and ending with “. . . fails to be satisfied.”, the reference to the papers [3,4]
 18 is incorrect. Hereby, we reformulated the text and corrected the reference
 19 to the works [3,4] as reported below.

20 “The effective elasticity tensor

$$(\mathbb{A}_{n,k-1,l-1}^{\text{sc}} - \mathbb{L}_{n,k-1,l-1})$$

21 should be such that the matrix associated with the bilinear form
 22 $a(\cdot, \cdot)$ in the Finite Element discretisation of (62a) is invertible.
 23 Although this is actually the case for the problem at hand, we have
 24 not formulated theorems yet, which predict when this condition fails
 25 to be satisfied. In linearised Elasticity, it is often required that the
 26 elasticity tensor is strongly elliptic, a condition that is also related
 27 to the existence of ‘plane progressive elastic waves in all possible
 28 directions’ and to the reality of wave speeds [2]. In the context of
 29 Elastoplasticity, the issue of strong ellipticity has been studied, for
 30 example, in [3], whereas a spectral analysis of the acoustic tensor
 31 associated with a particular constitutive law for the stress tensor
 32 can be found in [4].”

33 Note that the references [2], [3], and [4] correspond, respectively, to the
 34 references [68], [17], and [18] of the original paper [1].

- 35 3. In the sentence “The algorithm proposed in this paper [. . .] with respect to
 36 \mathbf{B}_{pn} .” it should be emphasised that the algorithm requires a linearisation
 37 also with respect to the pressure evaluated at the time instant t_n , i.e. p_n .
 38 Accordingly, the corrected text should read as follows:

39 “The algorithm proposed in this paper requires a linearisation with
 40 respect to p_n and χ_n , and one with respect to \mathbf{B}_{pn} .”

41 Corrections to Sect. 5

42 In the last paragraph, the sentence “Within the Newton iteration, . . . linearised
 43 sub-problems.” should be changed as follows:

44 “Within the Newton iteration, an ILU-decomposition, accelerated by a
 45 Bi-CGSTAB method, solves the linearised sub-problems.”

References

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