A cohesive finite element for quasi-continua

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We have found the following typos and errors in the article,
A cohesive finite element for quasi-continua:

1. Page 2, Eq. (5),

$$\mathbf{P}^+ \cdot \mathcal{N}^+ = \mathbf{P}^- \cdot \mathcal{N}^- \quad \text{on } S_0^\pm,$$

should change to

$$\mathbf{P}^+ \cdot \mathcal{N}^+ + \mathbf{P}^- \cdot \mathcal{N}^- = 0 \quad \text{on } S_0^\pm.$$

2. Page 2, Eq. (7),

$$\begin{aligned} & \int_{B_0^\pm} \rho_0 \ddot{\boldsymbol{\varphi}} \cdot \delta \boldsymbol{\varphi} dV + \int_{B_0^\pm} \mathbf{P}(\boldsymbol{\varphi}) \cdot \delta \mathbf{F} dV \\ &= \int_{\partial_r B_0^\pm} \bar{\mathbf{t}} \cdot \delta \boldsymbol{\varphi} dS + \int_{S_0} \left(\mathbf{P}(\boldsymbol{\varphi}) \cdot \mathbf{N} \right) \\ & \quad \cdot \delta(\boldsymbol{\varphi}^+ - \boldsymbol{\varphi}^-) dS, \end{aligned}$$

should change to

$$\begin{aligned} & \int_{B_0^\pm} \rho_0 \ddot{\boldsymbol{\varphi}} \cdot \delta \boldsymbol{\varphi} dV + \int_{B_0^\pm} \mathbf{P}(\boldsymbol{\varphi}) : \delta \mathbf{F} dV \\ &= \int_{\partial_r B_0^\pm} \bar{\mathbf{t}} \cdot \delta \boldsymbol{\varphi} dS + \int_{S_0} \left(\mathbf{P}(\boldsymbol{\varphi}) \cdot \mathcal{N} \right) \cdot \delta(\boldsymbol{\varphi}^+ - \boldsymbol{\varphi}^-) dS. \end{aligned}$$

3. Page 5, Eq. (32),

$$\mathbf{f}^{\text{cohe}} = \int_{S_0} \frac{\partial W^s}{\partial \boldsymbol{\Delta}^d} [\mathbf{N}^s]^T dS,$$

should change to

$$\mathbf{f}^{\text{cohe}} = \int_{S_0} \frac{\partial W^s}{\partial \boldsymbol{\Delta}} [\mathbf{N}^s]^T dS.$$

4. Page 6, Eq. (42),

$$\begin{aligned} \frac{\partial \mathbf{r}^{ij}}{\partial \boldsymbol{\Delta}^d} &= \frac{\partial \boldsymbol{\Delta}}{\partial \boldsymbol{\Delta}^d} + \frac{\partial \mathbf{h}^+}{\partial \boldsymbol{\Delta}^d} - \frac{\partial \mathbf{h}^-}{\partial \boldsymbol{\Delta}^d} \\ &= \mathbf{N}^s + \frac{\partial \mathbf{h}^+}{\partial \mathbf{d}^+} \frac{\partial \mathbf{d}^+}{\partial \boldsymbol{\Delta}^d} - \frac{\partial \mathbf{h}^-}{\partial \mathbf{d}^-} \frac{\partial \mathbf{d}^-}{\partial \boldsymbol{\Delta}^d} \\ &= \mathbf{N}^s + \frac{1}{2} \mathbf{B}^+ \mathbf{H}^+ - \frac{1}{2} \mathbf{B}^- \mathbf{H}^-, \end{aligned} \quad (0.1)$$

should change to

$$\begin{aligned} \frac{\partial \mathbf{r}^{ij}}{\partial \boldsymbol{\Delta}^d} &= \frac{\partial \boldsymbol{\Delta}}{\partial \boldsymbol{\Delta}^d} + \frac{\partial \mathbf{h}^+}{\partial \boldsymbol{\Delta}^d} - \frac{\partial \mathbf{h}^-}{\partial \boldsymbol{\Delta}^d} \\ &= \mathbf{N}^s + \frac{\partial \mathbf{h}^+}{\partial \mathbf{d}^+} \frac{\partial \mathbf{d}^+}{\partial \boldsymbol{\Delta}^d} - \frac{\partial \mathbf{h}^-}{\partial \mathbf{d}^-} \frac{\partial \mathbf{d}^-}{\partial \boldsymbol{\Delta}^d} \\ &= \mathbf{N}^s + \frac{1}{2} \mathbf{B}^+ \mathbf{H}^+ + \frac{1}{2} \mathbf{B}^- \mathbf{H}^-. \end{aligned} \quad (0.2)$$

5. Page 6, Eq. (43),

$$\begin{aligned} \frac{\partial W^{es}}{\partial \boldsymbol{\Delta}^d} &= \frac{N_{es}}{2A_{es}} \sum_{j=1}^{M_s} E'_{ij}(r^{ij}) \frac{\partial r^{ij}}{\partial \boldsymbol{\Delta}^d} = \frac{N_{es}}{2A_{es}} \sum_{j=1}^{M_s} E'_{ij}(r^{ij}) \frac{1}{r^{ij}} \\ & \quad \times \left(\mathbf{r}^{ij} \cdot \mathbf{N}^s + \frac{1}{2} \mathbf{r}^{ij} \cdot \mathbf{B}^+ \mathbf{H}^+ - \frac{1}{2} \mathbf{r}^{ij} \cdot \mathbf{B}^- \mathbf{H}^- \right), \end{aligned}$$

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should change to

$$\frac{\partial W^{es}}{\partial \Delta^d} = \frac{N_{es}}{2A_{es}} \sum_{j=1}^{M_s} E'_{ij}(r^{ij}) \frac{\partial r^{ij}}{\partial \Delta^d} = \frac{N_{es}}{2A_{es}} \sum_{j=1}^{M_s} E'_{ij}(r^{ij}) \frac{1}{r^{ij}} \\ \times \left(\mathbf{r}^{ij} \cdot \mathbf{N}^s + \frac{1}{2} \mathbf{r}^{ij} \cdot \mathbf{B}^+ \mathbf{H}^+ + \frac{1}{2} \mathbf{r}^{ij} \cdot \mathbf{B}^- \mathbf{H}^- \right).$$

6. Page 6, Eq. (44),

$$\frac{\partial W^{es}}{\partial \Delta^d} = \frac{N_{es}}{2A_{es}} \sum_{j=1}^{M_s} \frac{E'_{ij}(r^{ij})}{r^{ij}} \\ \times \left([\mathbf{N}^{sT}] \mathbf{r}^{ij} + \frac{1}{2} [\mathbf{B}^+ \mathbf{H}^+]^T \mathbf{r}^{ij} - \frac{1}{2} [\mathbf{B}^- \mathbf{H}^-]^T \mathbf{r}^{ij} \right),$$

should change to

$$\frac{\partial W^{es}}{\partial \Delta^d} = \frac{N_{es}}{2A_{es}} \sum_{j=1}^{M_s} \frac{E'_{ij}(r^{ij})}{r^{ij}} \\ \times \left([\mathbf{N}^{sT}] \mathbf{r}^{ij} + \frac{1}{2} [\mathbf{B}^+ \mathbf{H}^+]^T \mathbf{r}^{ij} + \frac{1}{2} [\mathbf{B}^- \mathbf{H}^-]^T \mathbf{r}^{ij} \right).$$

7. Page 6, Remark 2,

“From (43), we observe that when $\mathbf{B}^+ \mathbf{H}^+ = \mathbf{B}^- \mathbf{H}^-$, the expression of nodal traction will reduce to:”

should change to

“If $\mathbf{F}^+ \approx \mathbf{F}^-$, $\mathbf{F}^+ \mathbf{H}^+ - \mathbf{F}^- \mathbf{H}^- \approx 0$, because $\mathbf{H}^+ = \mathbf{H}^-$. Then the expression of nodal traction vector will reduce to:”.