Errata

Size effect and asymptotic matching approximations in strain-gradient theories of micro-scale plasticity [International Journal of Solids and Structures 39 (2002) 5633–5657] [☆],[☆☆]

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An error regrettably occurred in the treatment of tensorial function Φ_{ijk}. Similar to Λ_{ijk} and Π_{ijk}, variable Φ_{ijk} as a function of deflection parameter w was considered in Section 3.3 to be a homogeneous function of degree 1. However, a dependence on w of the strain intensity $\bar{\epsilon}$ appearing in the denominator of Eq. (47) was overlooked. This means that Φ_{ijk} is actually asymptotically independent of w. This correction affects in obvious way the subsequent equations (64)–(71) and the important consequence is that Eq. (66) should read $\bar{f}_k \propto w^{1/2}$ instead of $\bar{f}_k \propto w^{3/2}$. This means that the asymptotic small-size load–deflection curve is concave, rather than convex, and begins with a vertical, rather than horizontal, tangent. A further consequence is that $\bar{\kappa}^{3/2}$ in Eq. (75) in the example of wire torsion should be replaced by $\bar{\kappa}^{1/2}$. The same correction needs to be made in Eqs. (29) and (33) of the preceding paper by Bažant (JMPS 2002) referenced in this paper. The main conclusions, which concern the scaling of nominal stress σ_N (including the excessive small-size asymptotic size effect), remain unaffected by this correction.