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Eshelby's inclusion problem in large deformations. (English) Zbl 1473.74024
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Summary: In this contribution, we propose a multiplicative decomposition of the deformation gradient corresponding to the imagined procedure that *J. D. Eshelby* [Proc. R. Soc. Lond., Ser. A 241, 376–396 (1957; [Zbl 0079.39606](#))] used to investigate the theory of inclusions in the case of infinitesimal deformations. The proposed multiplicative decomposition is inspired by classical multiplicative decompositions reported in the literature and encompasses, as particular cases, other decompositions proposed for Eshelby's inclusion problem. The linearisation of the proposed multiplicative decomposition coincides with the additive decomposition of the infinitesimal strain in Eshelby's original procedure.

MSC:

[74E05](#) Inhomogeneity in solid mechanics

[74B20](#) Nonlinear elasticity

[74C15](#) Large-strain, rate-independent theories of plasticity (including nonlinear plasticity)

[74A05](#) Kinematics of deformation

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Keywords:

Eshelby strain; deformation gradient; mixed multiplicative decomposition; linearisation

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