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XFEM with equivalent eigenstrain for matrix-inclusion interfaces. (English) Zbl 1398.74301
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Summary: Several engineering applications rely on particulate composite materials, and numerical modelling of the matrix-inclusion interface is therefore a crucial part of the design process. The focus of this work is on an *original* use of the equivalent eigenstrain concept in the development of a *simplified* eXtended Finite Element Method. Key points are: the replacement of the matrix-inclusion interface by a coating layer with small but finite thickness, and its simulation as an inclusion with an *equivalent eigenstrain*. For vanishing thickness, the model is *consistent* with a spring-like interface model. The problem of a spherical inclusion within a cylinder is solved. The results show that the proposed approach is effective and accurate.

MSC:

- [74S05](#) Finite element methods applied to problems in solid mechanics
- [74E30](#) Composite and mixture properties
- [74S30](#) Other numerical methods in solid mechanics (MSC2010)
- [74E05](#) Inhomogeneity in solid mechanics
- [74B05](#) Classical linear elasticity

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Keywords:

XFEM; spring-like interface; equivalent eigenstrain; variational formulation

Software:

CUBPACK

Full Text: [DOI](#)

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