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NUMERICAL MODELLING OF IMPERFECT INTERFACES BASED ON REGULARIZED DISCONTINUITIES

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Several engineering applications rely on particulate composite materials. Therefore, numerical modelling of the matrix-inclusion interface is a crucial part of the design process. We previously proposed a variational framework for imperfect interfaces where the interface kinematics is regularized following [1]. This variational framework has been implemented in the *regularized* eXtended Finite Element Method [2].

In this work, we propose an *original* use of Eshelby's equivalent eigenstrain concept [3] in the development of the aforementioned regularized eXtended Finite Element Method [4]. The matrix-inclusion interface is replaced by a coating layer with small but finite thickness. The coating layer is simulated 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 are compared with the analytical solution obtained in [5]. It is shown that the proposed approach is effective and accurate.

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