

Weight functions for fracture problems along soft imperfect interfaces

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We consider interfacial crack problems in bi-material linearly elastic and isotropic solids with soft imperfect interfaces. The presence of imperfect interfaces (typically used to model a thin layer of adhesive) fundamentally alters the distribution of stresses near interfacial crack tips. Taking this behaviour into account, we formulate suitable weight function problems and employ Wiener-Hopf type methods to find their solutions. These auxiliary solutions aid in the evaluation of all important constants in asymptotic expressions describing physical fields. Further, perturbation analysis then allows for the influence of small defects on the propagation of the main crack to be described.