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On Numerical Evaluation of Mixed Mode Crack Propagation Coupling Mechanical and Thermal Loads in Wood Material

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Résumé en anglais	The mixed-mode crack growth coupling mechanical and thermal loads in wood material is investigated in this numerical work. The analytical formulation the crack driving force, namely the energy release rate, is introduced by T-integral that takes into account mixed mode fracture, thermal process in orthotropic material and pressure applied on the crack lips. This new formulation is based on Nother's theorem and the definition of the strain energy density according to Lagrangian's and Eulerian's configurations. Moreover, this analytical formulation is implemented in finite element software Cast3m. First of all, several numerical examples, dealing with isotropic material, are provided to illustrate the accuracy of the FEM model. Then, the crack resistance of a timber CTS (Compact Tension Specimen) is investigated to show the efficiency of the proposed approach in the case of orthotropic material.
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[3] http://okina.univ-angers.fr/publications?f%5Bauthor%5D=27326
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