Modélisation Numérique du comportement à l'endommagement d'un matériau composite

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Abstract: In this thesis, we focused on the development of micromechanical model specific to plain woven composite in order to predict their progressive damage , where the law of material behavior is considered as nonlinear elasto-plastic (this depend on tensile test results) . The first part of the work will be conducted to elaborate plain woven composite specimen and perform tensile test. After that micromechanical model would be developed in order to determine the initial effectives elastic modulus from homogenization techniques, of RVE, which can be used to relate between Mico scale and Macro scale. Subsequently, an incremental formulation of the unit cell method will be considered taking into account the evolution of plasticity and damage. The implementation of investigated approach will be achieved through finite element code and the validation of the model will be considered in the case of a quasi-static loading.

Keywords : Woven composite, damage, plasticity