Qualitative pivot damage analysis in aluminum printed pantographic sheets: numerics and experiments

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Abstract In this paper we present a model in which the motions of two families of beams constituting a pantographic sheet, when described with two independent placement fields, allows to correctly simulate the points of fracture onset in axial tension test. The deformation energy is postulated in function of these independent displacements as involving an additive quadratic term of deformation energy depending on the squared norm of their difference. The first performed numerical simulations establish that the most strained pivots are exactly the ones where one observes the first rupture.