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Calibration of Anisotropic Elastic-Plastic Models for Thin Layers and Foils in Microtechnologies: Two Novel Techniques

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The methods presented in this paper for the identification of material parameters in anisotropic elastoplasticity at the microscale exhibit the following new features in their experimental stage: data gathered from both indentation curves and imprint mapping in the former technique, which is intended for the mechanical characterisation of thin layers on substrate; in the latter, a device which pressurises a free foil specimen and measures the geometry of the inflated membrane by a laser profilometer. At the computational stage, traditional least-square techniques are employed for the inverse analysis based on finite-element large-strain simulations, which are used also for sensitivity analyses.

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