

## Parametrical Simulation of Sheet Metal Forming Process to Control the Localized Thinning

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**Abstract :** Sheet metal forming process has a multiple successive steps starting from sheets fixation to sheets evacuation. Often after forming operation, the sheet has defects requiring additional corrections steps. For example, in the drawing process, the formed sheet may have several defects such as springback, localized thinning and bends. All these defects are directly dependent on process, geometric and material parameters. The prediction and elimination of these defects requires the control of most sensitive parameters. The present study is concerned with a reliable parametric study of deep forming process in order to control the localized thinning. The proposed approach will be based on stochastic finite element method. Especially, the polynomial Chaos development will be used to establish a reliable relationship between input (process, geometric and material parameters) and output variables (sheet thickness). The commercial software Abaqus is used to conduct numerical finite elements simulations. The automatized parametrical modification is provided by coupling a FORTRAN routine, a PYTHON script and input Abaqus files.

**Keywords :** sheet metal forming, reliability, localized thinning, parametric simulation

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