HOW THE MULTISCALE ARLEQUIN FRAMEWORK COULD HELP FOR SHEET METAL FORMING SIMULATION

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Abstract

The Arlequin method [1] is a general numerical methodology that superposes models and glues them to each others, while partitioning the energies. Thus, by construction, this approach creates a partition of models that allows, with a significant enhanced flexibility and thus with computational costs reduction, for local changes or enrichments of existant global coarse numerical models. It has been assessed numerically (see e.g. [2],[3]) as a tool able to, for instance, blend a local 3D and a global Shell model, introduce a local defect or even propagate a local model to follow a crack propagation or an evolving contact zone [4], without remeshing the global existant finite element model.

The Arlequin method will be recalled during the talk. Some of its applications will be shown. The link between these applications and some challenging points in sheet metal forming simulation (wrinkles, cracks, sharp contact pressions, incremental implicit metal forming, etc.) will be discussed

References

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