

WCCM-ECCM-ECFD 2014

Title: ADVANCES IN THE MODELLING OF FORMING OPERATIONS

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Brief Description of the Mini-Symposium

The numerical modeling of forming operations has experienced a significant growth over the last decade. New mathematical formulations and numerical solution strategies allied to the dramatic increase in computational power/cost ratio have fostered the research growth in this continuously expanding field. In particular, major advances have been realized in the development of finite element based tools for the simulation of a wide range of industrial forming processes. The research activity has been devoted to several aspects of numerical simulation. We have observed an intense work on mechanical formulations, on treatments of complex constitutive equations, inverse identification procedures, complex three-dimensional problems, the use of optimal elements, adaptative remeshing techniques, contact and frictional phenomena, coupling between different fields, faster methods for solving discretized equations, adaptation of the numerical codes to parallel computation, etc. Undoubtedly, these developments play a central role in advancing the understanding of complex forming operations.

Nevertheless, new challenges are always emerging from industry with the necessity to treat a large variety of forming processes. The presence of internal damage, more complicated couplings, complex boundary conditions, among others, increase the difficulty of predicting the final properties of the part and also the optimization of the forming sequence. Therefore, a Mini-Symposium on ADVANCES IN THE MODELLING OF FORMING OPERATIONS is a timely concern. The aim is to give a state of the art and a survey about recent developments and to create perspectives for future research trends.