UNIVERSITÀ DEGLI STUDI DI BERGAMO
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Annuncio di Seminario

Current Issues in Explicit FE Simulations with Emphasis on Closing the Process Chain

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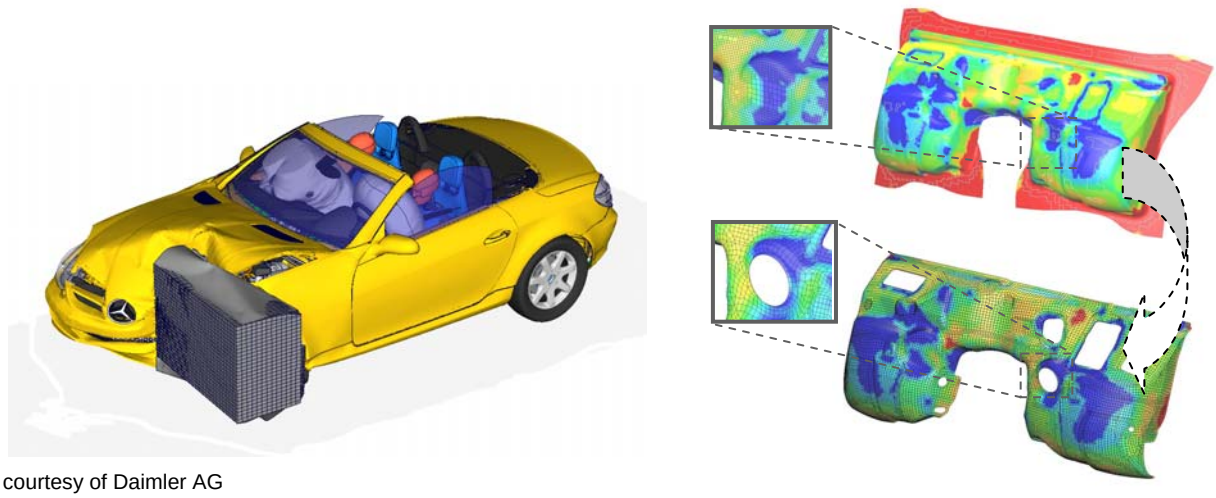
Nowadays simulations of **sheet metal forming** processes as well as **crash simulations** are done on a very high level of sophistication. During the past two decades both simulation disciplines developed a strong research and application basis that build a sound foundation for every day engineering design decisions. However, from a numerical point of view, the constitutive approach in both fields is quite different. In sheet metal forming the dominating effect to predict sheet thinning, **plasticity**, **failure** and **damage** is due to the anisotropy of the rolled sheet metal. Hence applied plasticity models are based on the Hill criterion and were subsequently enhanced by many researchers. On the contrary, in crash simulations isotropic material models, based on classical von Mises plasticity, enhanced by **strain-rate dependency** and damage formulations are widely used. In both applications an initially undamaged, elastic reference state with constant sheet thickness is generally assumed.

Since the simulation models in both disciplines are driven to increasing predictability in terms of deformations, damage evolution and failure, the question arises whether and how the results from forming simulations need to be taken into account in the crash simulation. First steps in this direction are implemented in the finite element program LS-DYNA. After a rather general overview on various current issues in automotive **explicit simulation applications**, the present contribution addresses the question of the ***inclusion of forming results into the crash simulation to predict failure in numerical crashworthiness investigations***.



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