

IGA technology validation for forefront crashworthiness CAE analysis

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ABSTRACT

Since its release in 2005, Isogeometric Analysis technology has drawn significant attention for its potential to bridge the gap between the CAD and CAE worlds, allowing for a more streamlined workflow. With IGA technology, design features can be embedded in the CAE solver, making it possible to include them as optimization variables throughout the design process, from the pre-concept phases to the final product release.

This paper analyses IGA potential for producing more efficient and lightweight car body designs through improved accuracy in capturing crash deformation patterns and ductile fracture. To achieve this goal, first IGA technology needs to be validated before integrating it into actual production.

To validate IGA technology, IDIADA conducted a comparison of IGA results to coupon and component testing, as well as state-of-the-art FEA results involving crash-like deformation patterns and material fracture. These activities were carried out as part of an Industrial Doctoral PhD, in-house innovation programs, and actual production projects. Testing and FEA results courtesy of Faraday Future.