## A NURBS-based solid-shell element employing the Assumed Natural Strain Method for structural analysis in the nonlinear regime

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## ABSTRACT

In 2005, Hughes and co-workers [1] introduced the concept of Isogeometric Analysis (IGA), promoting the use in numerical simulations of mathematical parameterizations employed in the exact description of geometric entities. Despite showing a greater accuracy per number of degrees-of-freedom when compared to FEM, studies have demonstrated that NURBS-based formulations are still affected by locking effects. [2]. Recently, the Assumed Natural Strain (ANS) method was used as an efficient way to alleviate locking in the analysis of thin structures within the framework of IGA [3]. The present work is related to the extension of this method to the analysis of geometric and material nonlinear problems [4]. To this end, an Updated Lagrangian formulation is proposed, combined with a corotational framework and integrated into a general "solid-shell" formulation. The results show that this approach is able to properly predict the behavior of thin structures subjected to large deformations in the elastoplastic range.

## REFERENCES

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