

IMPLEMENTATION OF SHELL ELEMENTS TO JULIAFEM PROJECT

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ABSTRACT

JuliaFEM is an open-source finite element package written in the Julia programming language [1]. Officially, Julia is a high-level and high-performance dynamic programming language for numerical computing. The promise is to reach the speed of compiled languages such as C and Fortran but retain the dynamics of high-level languages such as Python. JuliaFEM is designed for both industrial and academic usage. It has interfaces to various industrial FEM solvers such as ABAQUS and CODE ASTER. The idea is to allow rapid development of large-scale simulation models for testing. The open-source community around the solver makes the framework interesting also from the academic point of view.

In this work, we utilize the JuliaFEM package to benchmark shell elements of the type introduced in [2]. The focus of the work is on the implementation and performance but some theoretical issues related to the accuracy of shell elements will also be discussed.

REFERENCES

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- [2] A.H. Niemi, “Benchmark Computations of Stresses in a Spherical Dome with Shell Finite Elements”, *SIAM J. Sci. Comput.*, Vol. **38**, pp. B440–B457, (2016).