

# Isogeometric collocation for the Reissner-Mindlin shell problem

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## ABSTRACT

We present an isogeometric collocation formulation for Reissner-Mindlin shells. After recalling the necessary basics on differential geometry and the shell governing equations [1], we show that the typically used approach of expressing the equilibrium equations in terms of the primal variables is not a feasible way for shells due to the complexity of the underlying equations. We then propose an alternative approach, called step-wise formulation, and show its numerical implementation within an isogeometric collocation framework [2]. We perform numerical tests on a set of benchmark examples, which comprise important aspects like locking and boundary layers and which confirm the accuracy of the method. We also present an indicative study on the computational costs, which confirms the efficiency of the method, especially for higher polynomial degrees.

## REFERENCES

- [1] Y. Basar and W. Krätzig. *Theory of Shell Structures*, VDI Verlag, 2001.
- [2] F. Auricchio, L. Beirão da Veiga, T.J.R. Hughes, A. Reali, and G. Sangalli, “Isogeometric collocation methods”, *Mathematical Models and Methods in Applied Sciences*, Vol 20, pp. 2075-2107, (2010).