

# Approximation of branch of nonsingular solutions of Marguerre-von Kármán equations

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The objective of this work is to study the approximation of branch of nonsingular solutions of Marguerre-von Kármán equations for the buckling of a nonlinearly thin elastic shallow shell. More precisely, based on the technics are due to Reinhart [1] and Brezzi et al. [2] about the numerical analysis of von Kármán equations for the buckling of a nonlinearly thin elastic plate, we studied the finite dimensional approximation of the branch of nonsingular solutions of Marguerre-von Kármán equations. Using the mixed finite element scheme of Hermann-Miyoshi, the convergence analysis and the error estimates are derived; under some assumptions on the function that defines the middle surface of the shallow shell.

## References:

- [1] L. Reinhart, On the numerical analysis of the von Kármán equations: Mixed finite element approximation and continuation techniques, *Numer. Math.* 39 (1982), p. 371-404, <https://doi.org/10.1007/BF01407870>
- [2] F. Brezzi, J. Rappaz, P. A. Raviart, Finite dimensional approximation of nonlinear problems, Part I: Branches of nonsingular solutions, *Numer. Math.* 36 (1980), p. 1-25, <https://doi.org/10.1007/BF01395985>

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