

Modified frame of Quasi Conforming and Application in Reissner-Mindlin Shell

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Summary

In this paper, a modified paradigm of quasi conforming finite element method with truncated polynomial expansions of in-domain displacements and derived expansions of strains is introduced. The purpose is to improve the drawbacks of the traditional one that neglecting the connections between the components of strain and lack of principle in the process of choosing polynomial expansions. Based on the modified framework a four-node quadrilateral flat shell element with complete quadratic polynomials for membrane and bending displacement fields is developed. Numerical tests are carried out for validation of the present element. The results show that the present element preserves all the advantages of the quasi conforming i.e., explicit stiffness matrix, convenient post processing and free from membrane and shear locking. The tests also prove that the present element gives excellent results, especially for the bending moments, and possesses stable convergence rate.

Keywords: quasi conforming, flat-shell, Taylor polynomial expansion, in-domain displacements.

