

Modeling Thin Shell Structures by a New Flat Shell Finite Element

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Abstract : In this paper, a new computationally-efficient rectangular flat shell finite element named 'ACM_RSBE' is presented. The formulated element is obtained by superposition of a new rectangular membrane element 'RSBE' based on the strain approach and the well known plate bending element 'ACM'. This element can be used for the analysis of thin shell structures, no matter how the geometrical shape might be. Tests on standard problems have been examined. The convergence of the new formulated element is also compared to other types of quadrilateral shell elements. The presented shell element 'ACM_RSBE' has been demonstrated to be effective and useful in analysing thin shell structures.

Keywords : finite element, flat shell element, strain based approach, static condensation

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