

## ENGLISH SUMMARY

### Kouhia, Reijo, ON HYBRID- AND MIXED FINITE ELEMENT METHODS

Some hybrid- and mixed finite element methods are considered in the case of linear thin beam model problem. Babuska-Brezzi condition, which plays very important role in the mathematical stability analysis of mixed methods, is also considered. Numerical convergence study have been made for some of the presented elements. A simple a posteriori error estimate is derived for linear mixed element and results of an adaptive calculations, based on this error estimate, is presented.

### Niemi, Jarmo, ACCURACY AND STABILITY OF SINGLE STEP ALGORITHMS FOR TRANSIENT STRUCTURAL DYNAMICS

A general family of single step algorithms for transient structural dynamics is analysed. The analysis is restricted to linear, symmetric and non-dissipative systems. Stability, convergence, accuracy and overshoot of the methods are considered. The conditions for algorithm parameters to exhibit good characteristics in these respects are given. When comparing individual algorithms of the family it is found that 'alfa-methods' and the new proposed methods are superior to collocation methods including the Wilson 'theta-method' and the Newmark method.