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DEVELOPMENT OF INDUSTRIAL FINITE ELEMENT CODE WITH PARALLEL FACILITIES USING SUBSTRUCTURING TECHNIQUE

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Application of the substructuring technique to the development of industrial finite element code intended for the linear and nonlinear analysis of the complex structures in the building design is considered.

Our approach is based on the one level substructuring algorithm, LU decomposition technique for solution of large systems of the linear equations and hybrid stress model finite elements [1-2]. A parallel version of the code is intended for Pentium and Pentium Pro multiprocessor platforms operating under Windows 95 or Windows NT. In this code Win32S library tools and Basic Linear Algebra Subroutines are used. The Win32S library tools are used for the parallel simultaneous LU decomposing of the substructuring systems of linear equations and the Basic Linear Algebra Subroutines are used in the parallel LU solver of the interface system of linear equations.

Numerous computing results including complicated structures of beams, plates, shells, elastic foundations, hinge and unilateral junctions illustrated algorithm facilities are presented. These structures describe the real problems arising in building design practice. Also some numerical results have been got using the second order deformation theory are presented.

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