Examensarbete vid Byggnadsmekanik

FEM-STABILITY ANALYSIS OF CORRUGATED BOARD

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Rapport
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Corrugated board is an example of a structural core sandwich material which has gained much popularity as a packaging material. It is also used in products which purely have a load carrying function, such as pallets. In most applications, the loading is shell like.

The numerical simulation, e.g. finite element calculations, of the mechanical behaviour of corrugated board is advanced by several factors

- *The stiffness and strength properties of the board is highly oriented, i.e. orthotropic.*

- *The board may fail by different failure modes, when loaded in-plane. Structural failure is possible as the bifircation of the board panel when loaded in-plane. In addition, local buckling of the board facings occurs between the corrugations.*

- *Considering the local stability of the board, a large amount of different deflection modes are feasible during the the load-deformation path. Therefore, the nonlinear reponse calculations require an incremental technique which captures complex load and displacement variations during the path.*

A detailed modelling and nonlinear finite element analysis of the board will provide a measure of how complex mechanical structures with a very large amount of degrees of freedom can be performed by numerical methods.

The work will be performed by ABAQUS (and/or LS-DYNA), at the Division of Structural Mechanics, LTH. Contact with SCA Research can be settled for e.g. test results of board constituents.