NASA TECH BRIEF

Langley Research Center

Computer Program for Buckling Loads of Orthotropic Laminated Stiffened Panels Subjected to Biaxial In-plane Loads (BUCLASP 2)

The problem:

In the analysis of laminated and stiffened, flat and curved panels, detail design is important, and dependable estimates of the buckling loads are needed.

The solution:

A general-purpose computer program has been designed to perform exact instability analyses for structures such as unidirectionally-stiffened, rectangular composite panels.

How it's done:

The structure is idealized as an assemblage of beam elements, laminated curved-plate elements, and laminated flat-plate elements. Each element extends the full length of the structure. The element edges that are normal to the longitudinal axis of the panel are assumed to be simply supported, and any external edge that is parallel to the longitudinal axis may be arbitrarily constrained by specifying the appropriate spring constants. The analysis is exact, based on linear elastic theory with prebuckling stresses and deformations ignored. Prior to buckling, the panel is subject to uniform strains so that each element has a constant (but not necessarily the same) biaxial loading.

Notes:

1. This program was written in FORTRAN IV and COMPASS for the CDC-series computers.
2. Inquiries concerning this program should be directed to:

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> 112 Barrow Hall
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> Reference: LAR-11199

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