


Jendi Kepple (PhD student)

See:
http://www.researchgate.net/profile/Jendi_Kepple
http://www.researchgate.net/profile/Jendi_Kepple/info

School of Mechanical and Manufacturing Engineering
New South Wales, Australia

Selected publications:

Jendi Kepple (1,2), Gangadhara Prusty (1), Garth Pearce (1), Donald Kelly (1) and Rodney Thomson (2,3)
(1) School of Mechanical and Manufacturing Engineering, The University of New South Wales, Sydney, Australia
(2) Cooperative Research Centre for Advanced Composite Structures, Melbourne, Australia
(3) Advanced Composite Structures Australia Pty Ltd, Melbourne, Australia
"Improved methods for modeling imperfections for buckling analysis of composite cylindrical shells", 29th Congress of the International Council of the Aeronautical Sciences, September 7-12, 2014
ABSTRACT: Carbon-fibre reinforced polymer (CFRP) cylindrical shells are used in a variety of aerospace applications. Such shells are extremely imperfection sensitive [1, 2] and feature a large scatter in buckling load levels induced from imperfections introduced in their manufacturing process. This paper aims to improve the stochastic modelling of cylindrical thickness imperfections in order to better replicate the stochastic variation of the actual thickness and material imperfections for FE analysis. These results will reduce the cost of producing and aid in improving the design and reliability of newly designed and untested cylinders by accurately modelling thickness and material imperfections for improved stochastic analysis and robust design.

Jendi Keple, G. Prusty, G. Pearce, Don Kelly, Rodney Thomson, Richard Degenhardt, "Influence of Imperfections on Axial Buckling Load of Composite Cylindrical Shells", 19th International Conference on Composite Materials, Source: DLR
ABSTRACT: There is a strong requirement for more robust, lighter and cheaper launch vehicle structures. Unstiffened composite cylindrical shells, which are essential to the fabrication of launch vehicle airframes, are prone to buckling and are highly sensitive to imperfections which arise during the manufacturing process. The buckling load is an important characteristic in design, and may vary drastically from the buckling load of the

perfect structure when realistic imperfections are present. [1] The current design guidelines for imperfection sensitive shells are based on the NASA-SP 8007 [2] which dates from 1965. Typically, the theoretical buckling load of a given cylinder design is predicted by performing a linear bifurcation analysis using closed-form equations of the geometrically perfect structure. This theoretical buckling load is then reduced by applying an empirical knockdown factor to account for the differences between theory and test. From recent literature [3-5], the NASA-SP 8007 knockdown factors used in the design of aerospace-quality shell structures were found to be overly conservative and inappropriate.

J. Kepple, M. Herath, G. Pearce, G. Prusty, R. Thomson (CRC-ACS) Stochastic analysis of imperfection sensitive composite cylinders using realistic imperfection models (CRC-ACS, University of New South Wales, Advanced Composite Structures Australia), Third International Conference on Buckling and Postbuckling behavior of Composite Laminated Shell Structures with DESICOS Workshop, 25-27 March, 2015