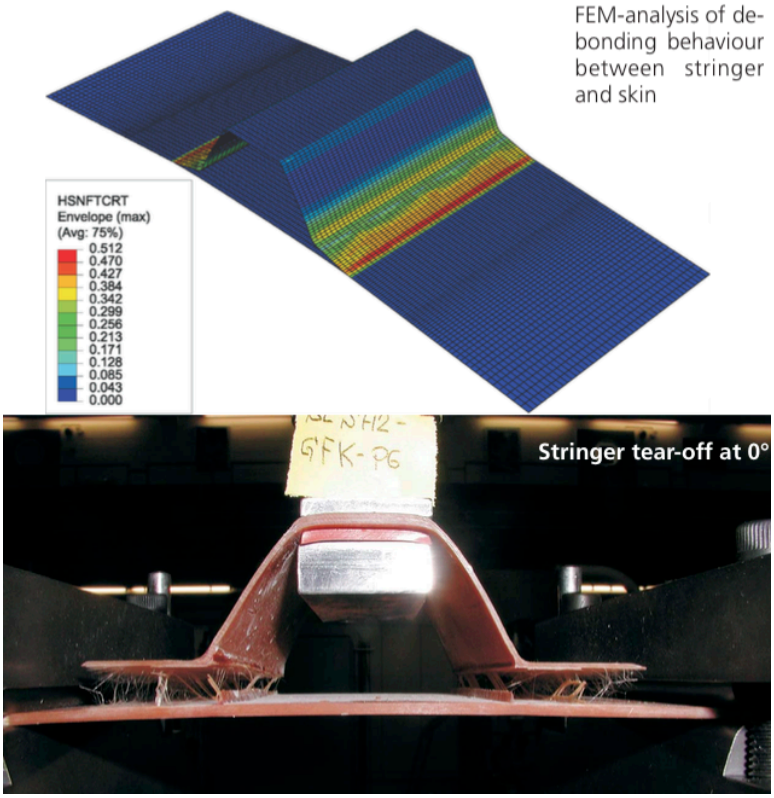

Falk Odermann, Dipl.-Ing From: "Testing And Analysis Of Omega Stringer De-Bonding"

See:
http://www.researchgate.net/profile/Falk_Odermann
http://www.dlr.de/fa/en/desktopdefault.aspx/tabid-1314/1807_read-19602/sortby-lastname/

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Selected Publications:

R. Khakimova, S. Castro, R. Degenhardt, D. Wilckens, M. Kepke, B. Hildebrandt, F. Odermann (DLR, PFH), "Buckling experiments on imperfection sensitive thin-walled structures using additional perturbation loads", Third International Conference on Buckling and Postbuckling behavior of Composite Laminated Shell Structures with DESICOS Workshop, 25-27 March, 2015

D. Wilckens, F. Odermann (DLR), "Buckling and Post Buckling of Stiffened CFRP Panels under Compression and Shear", Third International Conference on Buckling and Postbuckling behavior of Composite Laminated Shell Structures with DESICOS Workshop, 25-27 March, 2015

F. Odermann, M. Geier (DLR), "Buckling tests of unstiffened cylindrical composite shells under dynamic axial pulse loading", Third International Conference on Buckling and Postbuckling behavior of Composite

Laminated Shell Structures with DESICOS Workshop, 25-27 March, 2015

Falk Odermann, Alexander Kling, “Shear–Compression Buckling Test Method On Curved Stiffened Composite Panels”, ECCM16 Conference, 2015
ABSTRACT: A test method is described to experimentally investigate curved stiffened composite panels with respect to their buckling and post-buckling behavior up to collapse. The test method utilizes a new test rig with which stringer and frame stiffened curved panels can be tested under uniaxial compression loads, in-plane shear loads as well as a combination of both. During shear loading the panel is guided according to its radius. The whole test rig can be adjusted to cover a large range of geometric shell parameters.
Results will be presented for different stiffened composite panel designs. Effects of the chosen load introduction and the boundary conditions will be discussed, which have a considerable influence on the panel behavior. In addition, procedures and measurement techniques used during the tests will be explained. The findings confirm that the test method and in particular the new test rig is suitable to investigate representative stiffened structures under in-plane loading conditions relevant for stability analysis.

Falk Odermann, Tobias Wille, “Innovative Testing Methods on Specimen and Component Level.”, DOI: 10.1007/978-3-642-29190-6_16 In book: Adaptive, Tolerant and Efficient Composite Structures; Research Topics in Aerospace, Editors: Martin Wiedemann, Michael Sinapius, Chapter 16, pp.211 – 222, Springer-Verlag, 2012
ABSTRACT: In general, tests can be divided into four categories: parameter estimation (e.g. material strength), phenomenological investigation, validation and qualification. According to this classification tests are carried out on a structural or component level and on a coupon level. For structural testing a Buckling Test Facility, a Variable Component Test Facility and a thermo-mechanical test field are described. Furthermore, some short information is given on specimen level tests with devices for standard test machines: Stringer Pull-off Device and 3D-Biax Device.

Falk Odermann, Daniel Hartung, “Testing And Analysis Of Omega Stringer De-Bonding”, 5th International Conference on Composites Testing and Model Simulation, Source: DLR (See right-hand images above.)
ABSTRACT: The interface strength between omega stringers and the skin was tested at DLR Braunschweig. Therefor the stringer is teared- off with a new test device using a standard test machine.Pull angle can be variied from 0° to 45°. With the help ofthis device omega stringers can be tested according to stresses dominated by fracture Mode I and stresses from combined fracture Mode I and Mode II. This allows to compare different omega stringer geometries and bonding technics.In parallel a de-bonding analyses was made using different numerical approaches (e.g. 3D continuum damage model).

Wilckens, Dirk and Odermann, Falk and Kling, Alexander and Degenhardt, Richard, “Buckling and post buckling investigation of stringer stiffened CFRP panels under in-plane loading - experimental investigations”, In: Adaptive, Tolerant and Efficient Composite Structures Springer. pp. 189-197, 2012
ABSTRACT: In this contribution, results obtained from buckling and post buckling tests of stringer stiffened panels are presented. This work aimed to contribute to establish an advanced design scenario in which skin buckling is allowed clearly below limit load (LL) so that the considerable load carrying capacity reserves in the post buckling regime of a stringer stiffened panel are exploited. This finally leads to the reduction of structural weight. In this context, experiments of two nominal identical T-stringer stiffened CFRP panels are described and discussed. One panel was tested statically until collapse while the second one was subjected to cyclic loading. Prior testing, the test structures were assessed by NDI. During the experiments, additional to the load

shortening data and strain gauges, DIC (ARAMIS) as well as thermography measurements were utilized to gather information about the structural response. Furthermore, the concept to extend the existing test facility for the buckling and post buckling investigation of curved stiffened panels under combined axial and shear loading is described. In-plane shear as well as combined axial and shear loading are complementary to pure axial loading predominant and important load cases within buckling and post buckling investigations. With this extension of the buckling test facility a wide range of in-plane loading scenarios can be covered.