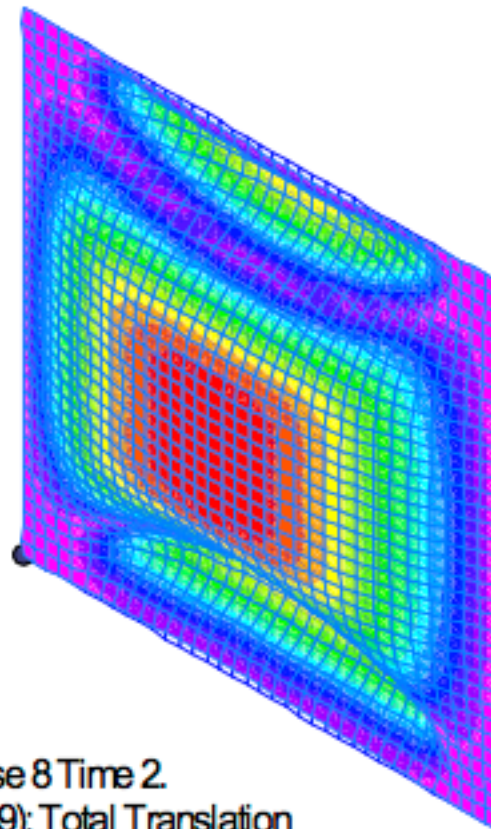




Professor Sérgio Frascino Müller de Almeida



Case 8 Time 2.
3.939): Total Translation
Total Translation

From: "Post buckling of composite panels subjected to thermal residual stresses"
by Ravetti and de Almeida, MSC Software presentation no. 21, 2007

See:

<http://translate.google.com/translate?hl=en&sl=pt&u=http://www.fapesp.br/2999&prev=search>

<http://translate.google.com/translate?hl=en&sl=pt&u=http://www.mec.ita.br/~frascino/&prev=search>

<http://translate.google.com/translate?hl=en&sl=pt&u=http://www.escavador.com/pessoas/435974&prev=search>

Technological Institute of Aeronautics (ITA),
São José dos Campos-SP, Brazil

Biography:

Graduated in Mechanical Engineering from the Technological Institute of Aeronautics (1978), master's degree in Aeronautical Engineering and Mechanics from the Technological Institute of Aeronautics (1982) and PhD in Aerospace Engineering - University of Kansas (1986). He is currently a professor at the Technological Institute of Aeronautics and area coordinator of the Support Foundation of São Paulo Research. He specializes in aerospace structures of composite materials, mainly in the following themes: Composites, finite elements, buckling, vibration and design. He is head of the Engineering Division ITA Mechanics (1989-1994 and 2002 to present) and was a member of the Advisory Committee of the area CNPq Aerospace Engineering (2002-2006), area coordinator of the Postgraduate ITA (1997 -1999 and 2001-2007), and deputy head of the ITA Graduate Division (2000-2002).

From: <http://www.petronoticias.com.br/archives/30633> :

Light-Weight Structures Laboratory Will Benefit IPT Oil & Gas Sector: The Institute for Technological Research (IPT) is completing the Lightweight Structures Laboratory (LEL) in the Technological Park of São José dos Campos (SP). The unit of 4500 [square meters], with opening scheduled in December 2013, will cater mainly to the aeronautical, automotive and oil & gas [industries], developing lighter and stronger structures. Among the materials used are metallic (such as aluminum and titanium), composites (polymers with some type of reinforcing fiber such as carbon, glass or cellulose) and hybrids. According to Sérgio Frascino Müller de Almeida (photo), professor of the Technological Institute of Aeronautics (ITA) and research project coordinator of aeronautical structures made of composite materials with support from FAPESP, the lab's prospects are very good. "The trend is to increase the use of composites for the development of lightweight structures and there is a great demand for this type of material in Brazil," he said. In total, the laboratory got R \$ 48 million in investments, of which R \$ 27.5 million from BNDES, to purchase equipment and implementation of laboratory; R \$ 8.3 million by the Financier of Studies and Projects (Finep) and R \$ 2.5 million by the City of São José dos Campos, with the support of the State of São Paulo. Approximately R \$ 10 million was completed at IPT and by FAPESP.

Selected Publications:

- De Almeida, S. F. and Hansen, J. S. (1997). Free Vibration Analysis of Composite Plates with Tailored Thermal Residual Stresses. ASME International Mechanical Engineering Congress and Exposition, AD 55 ASME:183–190
 - Nabarrete A., Almeida, S. F. M., Hansen, J. S., - "Sandwich plate vibration analysis: three layer quasi three-dimensional finite element model", AIAA Journal, Vol. 1, No. 8, pp. 1547-1555, 2003.
 - Faria, A. R., and Almeida, S. F. M., - "Buckling optimization of plates with variable thickness subjected to nonuniform uncertain loads", International Journal of Solids and Structures, Vol. 40, No. 15, pp. 3955-3966, 2003.
 - Faria A. R., and Almeida S. F. M., "Buckling optimization of variable thickness composite plates subjected to nonuniform loads", AIAA Journal, Vol. 42, No. 2, pp. 228-231, 2004.
 - Costa, M. L., Almeida, S. F. M., and Rezende, M. C., "Critical void content for polymer composite laminates", AIAA Journal, Vol. 43, No. 6, pp. 1336-1341, June 2005.
 - Conrado, A. C., Faria, A. R., and Almeida, S. F. M., - "Optimum design for buckling of arbitrary shaped ribs under uncertain loadings", The Aeronautical Journal, Royal Aeronautical Society, Volume 109, No. 1102, Dec. 2005.
 - Faria, A. R., and Almeida, S. F. M., - "The maximization of fundamental frequency of structures under arbitrary initial stress states", International Journal of Numerical Methods in Engineering, Vol 65, pp. 445-460, 2006.
 - Fernanda Mariana Nunes Ravetti and Sérgio Frascino Müller de Almeida, "Post buckling of composite panels subjected to thermal residual stresses", MSC Software Presentation Number 2007-21, 2007
- ABSTRACT: Composite material structures are completely stress free during curing or consolidating process, under high temperatures that vary between 120 deg. C and 400 deg. C. After this process, temperature decreases and material starts to get stiffer. As material physical properties are different in transverse and longitudinal direction, thermal residual stresses appear due to this difference, mainly because of thermal expansion coefficient. Thermal residual stresses effects can be null if the structure is a uniform (not stiffened) square plan panel symmetrically laminated, without external constraints. However, if the panel is reinforced or not symmetrically laminated, the resultant stresses can be not null and affect the panel mechanical behavior. This research studies post-buckling behavior of graphite-epoxy reinforced panels under compression in the presence

of thermal residual stresses, considering two different stringer types and three different stringer widths. According to the results found, thermal residual stresses can affect the panel mechanical behavior - depending on type and width of the stringers - increasing stiffness and changing buckling modes, mainly for smaller loads and wider stringers.

- Donadon M; Iannucci L; Falzon, B; Hodgkinson, J; De Almeida, S; Almeida, SFM. The progressive failure model for composite laminates Subjected to low velocity impact damage. *Computers & Structures*, vol. 86, p. 1232-1252, 2008.
- Boni, TL; Almeida, SFM. Laterally supported sandwich panels Subjected to large deflections Part 1: test apparatus design and experimental results. *Thin-Walled Structures*, vol. 46, p. 413-422, 2008.
- Boni, TL; Almeida, SFM. Laterally supported sandwich panels Subjected to large deflections Part 2: FE analyzes and model validation. *Thin-Walled Structures*, vol. 46, p. 423-434, 2008.
- Arbelo, Mariano; de Almeida, Sergio Frascino Muller; Donadon Mauricio. A Numerical Model for Post-Buckling Analysis of Composite Shear Webs. *Mechanics of Advanced Materials and Structures*, vol. 17, p. 313-319, 2010.
- Arbelo, Mariano A.; de Almeida, Sergio M. Frascino; Donadon, Maurice V.. An experimental and numerical analysis for the post-buckling behavior of composite shear webs. *Composite Structures*, vol. 93, p. 465-473, 2011.
- S. F. M. de Almeida, "Elastic behavior optimization of composite laminates using lamination parameters," in *5th Workshop on Computational Approaches to Material Modeling and Optimisation - WCAMMO 2011*, 2011, no. November, pp. 32-38.
- Almeida, A.; Donadon, MV; De Faria, AR; de Almeida, SFM. The effect of piezoelectrically induced stress stiffening on the aeroelastic stability of curved composite panels. *Composite Structures*, vol. 94, p. 3601-3611, 2012.
- Arbelo, Mariano A.; De Almeida, Sergio FM; Donadon, Maurice V.; Rett, Sandro R.; Degenhardt, Richard; Castro, Saullo GP; Kalnins, Kaspars; Ozoli 'O'ERTS. Vibration correlation technique for the estimation of real boundary conditions and buckling load of unstiffened plates and cylindrical shells. *Thin-Walled Structures*, vol. 79, p. 119-128, 2014.
- Bohrer, Rubens Zolar Gehlen; De Almeida, Sérgio Frascino Müller; Donadon, Mauricio Vicente. Optimization of composite plates Subjected to buckling and small mass impact using lamination parameters. *Composite Structures*, vol. 120, p. 141-152, 2015.