

References

- [1] Ajay Sharma, Thomas Rose, Nicholas Bearns, Thomas Murphey, and Francisco Lopez Jimenez. Analysis of geometric and material nonlinearity in the column bending test. *AIAA Journal*, 62:1–11, 12 2023.
- [2] Sergio Pellegrino. *Elastic Folding of Shell Structures*, pages 77–98. 01 2001.
- [3] Joni Jorgensen, Ehlias Louis, Jason Hinkle, Mark Silver, Bill Zuckerman, and Scott Enger. Dynamics of an elastically deployable solar array: Ground test model validation. *Collection of Technical Papers - AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Materials Conference*, 3, 04 2005.
- [4] D. S. Adams and M. Mobrem. Lenticular jointed antenna deployment anomaly and resolution onboard the mars express spacecraft. *Journal of Spacecraft and Rockets*, 46(2):403–410, 2009.
- [5] Rui Cai and Tan Jin. The effect of microstructure of unidirectional fibre-reinforced composites on mechanical properties under transverse loading: A review. *Journal of Reinforced Plastics and Composites*, 37(22):1360–1377, 2018.
- [6] A. P. Mouritz, M. K. Bannister, P. J. Falzon, and K. H. Leong. Review of applications for advanced three-dimensional fibre textile composites. *Composites Part A: Applied Science and Manufacturing*, 30:1445–1461, 1999.
- [7] Y. Huang, X. Tian, Z. Zheng, D. Li, A. V. Malakhov, and A. N. Polilov. Multiscale concurrent design and 3d printing of continuous fiber reinforced thermoplastic composites with optimized fiber trajectory and topological structure. *Composite Structures*, 285:115241, 2022.
- [8] Tian-Wei Liu, Jiang-Bo Bai, Nicholas Fantuzzi, and Xiang Zhang. Thin-walled deployable composite structures: A review. *Progress in Aerospace Sciences*, 146:100985, 2024.
- [9] William K. Wilkie. *Overview of the NASA Advanced Composite Solar Sail System (ACS3) Technology Demonstration Project*.
- [10] O. Soykasap. Micromechanical models for bending behavior of woven composites. *Journal of Spacecraft and Rockets*, 43(5):1093–1100, 2006.
- [11] A. D. B. L. Ferreira, P. R. O. Novoa, and A. T. Marques. Multifunctional material systems: A state-of-the-art review. *Composite Structures*, 151:3–35, 2016.

- [12] C. Mallikarachchi and S. Pellegrino. Design and validation of thin-walled composite deployable booms with tape-spring hinges. In *Proceedings of an unspecified conference*, s.l., 2011. s.n.
- [13] H. M. Y. C. Mallikarachchi and S. Pellegrino. Failure criterion for two-ply plain weave cfrp laminates. *Journal of Composite Materials*, 47(11):1357–1375, May 2013.
- [14] M. Y. Hamillage and H. M. Y. C. Mallikarachchi. Predicting non-linear bending behaviour of thin woven fibre composites. In *Proceedings of [Conference Name]*, s.l., 2017. s.n.
- [15] M. Jayasekara. *Non-linear Bending Behaviour of Thin Woven Fibre Composites Under High Curvatures*. PhD thesis, University of Moratuwa, s.l., 2020.
- [16] Uditha Weerasinghe, Sumudu Herath, and Chinthaka Mallikarachchi. Homogenization of ultra thin woven composite structures at high curvatures. In *Proceedings of the Moratuwa Engineering Research Conference (MERCon)*, pages 1–5, 2022.
- [17] M. Mobrem and D. Adams. Deployment analysis of the lenticular jointed antennas onboard the mars express spacecraft. *Journal of Spacecraft and Rockets*, 46(2):394–402, Mar. 2006.
- [18] M. Sakovsky and S. Pellegrino. Closed cross-section dual-matrix composite hinge for deployable structures. *Composite Structures*, 208:784–795, Oct. 2018.
- [19] H. M. Y. C. Mallikarachchi and S. Pellegrino. Simulation of quasi-static folding and deployment of ultra-thin composite structures. In *49th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference*, 2008.
- [20] Maria Sakovsky, Sergio Pellegrino, and H.M.Y.C. Mallikarachchi. *Folding and Deployment of Closed Cross-Section Dual-Matrix Composite Booms*.
- [21] H. M. Y. C. Mallikarachchi. *Thin-walled composite deployable booms with tapespring hinges*. PhD thesis, University of Cambridge, May 2011.
- [22] K. Ubamanyu and H. M. Y. C. Mallikarachchi. Simulation of dual-matrix composite booms. In *Proceedings of the Annual Sessions of Society of Structural Engineers*, 2016.
- [23] T. W. Murphey, W. Francis, B. Davis, and J. M. Mejia-Ariza. High strain composites. In *2nd AIAA Spacecraft Structures Conference*, 2015.
- [24] Jifeng Gao, Wujun Chen, Bing Yu, Pengxuan Fan, Bing Zhao, Jianhui Hu, Daxu Zhang, Guangqiang Fang, and Fujun Peng. A multi-scale method for predicting abd stiffness matrix of single-ply weave-reinforced composite. *Composite Structures*, 230:111478, 2019.
- [25] Jeffrey Yee and Sergio Pellegrino. *Biaxial Bending Failure Locus for Woven-Thin-Ply Carbon Fibre Reinforced Plastic Structures*.
- [26] G. E. Sanford, E. V. Ardelean, T. W. Murphey, and M. M. Grigoriev. High strain test method for thin composite laminates. In *16th International Conference on Composite Materials (ICCS-16)*, Porto, Portugal, June 28–30 2011.

- [27] M. E. Peterson and T. W. Murphey. High strain flexural characterization of thin cfrp unidirectional composite lamina. In *31st American Society for Composites Technical Conference*, Williamsburg, Virginia, September 19–22 2016.
- [28] M. E. Peterson and T. W. Murphey. Large deformation bending of thin composite tape spring laminates. In *54th AIAA Structures, Structural Dynamics, and Materials Conference*, Boston, Massachusetts, April 8–11 2013.
- [29] J. C. H. Yee and S. Pellegrino. Folding of woven composite structures. *Composites Part A: Applied Science and Manufacturing*, 36:273–278, 2005.
- [30] F. Lopez Jimenez. *Mechanics of Thin Carbon Fiber Composites with a Silicone Matrix*. PhD thesis, California Institute of Technology, Pasadena, California, 2011.
- [31] Juan M Fernandez and Thomas W Murphey. A simple test method for large deformation bending of thin high strain composite flexures. In *2018 AIAA spacecraft structures conference*, page 0942, 2018.
- [32] Ajay Sharma, Riley Perez, Nicholas Bearns, Thomas Rose, and Francisco Lopez Jimenez. Some considerations involving testing guidelines for large curvature bending of high strain composites using the column bending test. 01 2021.
- [33] Ajay Sharma, Thomas Rose, Andrew Seamone, Thomas Murphey, and Francisco Lopez Jimenez. Analysis of the column bending test for large curvature bending of high strain composites. 01 2019.
- [34] A. J. Lee and J. M. Fernandez. Mechanics of bistable two-shelled composite booms. In *5th AIAA Spacecraft Structures Conference, AIAA Scitech 2018 Forum*, Kissimmee, FL, January 8–12 2018.
- [35] J. M. Fernandez et al. Nasa’s advanced solar sail propulsion system for low-cost deep space exploration and science missions that use high performance rollable composite booms. In *4th International Symposium on Solar Sailing*, Kyoto, Japan, January 17–20 2017.
- [36] J. M. Fernandez. Advanced deployable shell-based composite booms for small satellite applications including solar sails. In *4th International Symposium on Solar Sailing*, Kyoto, Japan, January 17–20 2017.
- [37] J. M. Fernandez et al. An advanced composites-based solar sail system for interplanetary small satellite missions. In *5th AIAA Spacecraft Structures Conference, AIAA Scitech 2018 Forum*, Kissimmee, FL, January 8–12 2018.
- [38] Gao Jifeng, Wu-jun Chen, J. Chen, J. Hu, Bing Zhao, Daxu Zhang, G. Fang, and Fujun Peng. Accuracy analysis on counterweight-balanced column bending test. *Experimental Mechanics*, 62, 09 2021.
- [39] J. I. Múgica et al. Multiscale modelling of thermoplastic woven fabric composites: From micromechanics to meso mechanics. *Composite Structures*, 20, August 2019.
- [40] J. Mao et al. A modeling approach across length scales for progressive failure analysis of woven composites. *Applied Composite Materials*, 20:213–231, June 2013.

- [41] R. M. Jones. *Mechanics of Composite Materials*. Taylor & Francis Inc., 2nd edition, 1999.
- [42] Inc. Correlated Solutions. *Vic-3D Testing Guide*.
- [43] Thomas Murphey, Gregory Sanford, and Mikle Grigoriev. Nonlinear elastic constitutive modelling of large strains in thin carbon fibre composite flexures. In *16th International conference on composite structures, Porto, Portugal*, 2011.
- [44] Torayca. *Technical Data Sheet No. CFA-001, T300 Data Sheet*. Toray Industries, Inc.
- [45] PATZ. *Technical Data Sheet PMT-F4*. PATZ Materials and Technologies.
- [46] M. Daniel and O. Ishai. *Engineering Mechanics of Composite Materials*. McGraw-Hill Book Company, 2nd edition, 2006.
- [47] S. C. Quek, A. M. Waas, K. W. Shahwan, and V. Agaram. Analysis of 2d triaxial flat braided textile composites. *International Journal of Mechanical Sciences*, 45(6):1077–1096, 2003. [Online].
- [48] G. Curtis, J. Milne, and W. Reynolds. Non-hookean behaviour of strong carbon fibres. *Nature*, 220(5171):1024–1025, 1968.
- [49] Uba K. Ubamanyu and Sergio Pellegrino. *Nonlinear Behavior of IM7 Carbon Fibers in Compression Leads to Bending Nonlinearity of High-Strain Composites*, page Art. No. 2023–0580. American Institute of Aeronautics and Astronautics, Jan 2023. Funding by Space Solar Power Project.
- [50] A. Schlothauer, G. A. Pappas, and P. Ermanni. Material response and failure of highly deformable carbon fiber composite shells. *Composites Science and Technology*, 199:108378, October 2020.
- [51] Wim H.M. Van Dreumel and John L.M. Kamp. Non hookean behaviour in the fibre direction of carbon-fibre composites and the influence of fibre waviness on the tensile properties. *Journal of Composite Materials*, 11(4):461–469, 1977.
- [52] V. Keryvin, A. Marchandise, and J.-C. Grandidier. Non-linear elastic longitudinal behaviour of continuous carbon fibres/epoxy matrix composite laminae: Material or geometrical feature? *Composites Part B: Engineering*, 247:110329, 2022.
- [53] Nishangani Gowrikanthan, Milindu Jayasekara, Chinthaka Mallikarachchi, and Sumudu Herath. Effects of tow arrangements on the homogenized response of carbon fiber woven composites. *Composite Structures*, 300:116081, 2022.
- [54] Michael Smith. *ABAQUS/Standard User's Manual, Version 6.9*. Dassault Systèmes Simulia Corp, United States, 2009.
- [55] H.M.Y.C. Mallikarachchi. Predicting mechanical properties of thin woven carbon fiber reinforced laminates. *Thin-Walled Structures*, 135:297–305, 2019.
- [56] H. Wijesuriya. Predicting non-linear bending behaviour of ultra-thin woven fibre composites. Master's thesis, University of Moratuwa, Sri Lanka, 2019.