
Thomas M. Hermann

Consultant DER, Structural Dynamics & Dynamic Loads
Odonata Research LLC
<http://www.odonata-research.com/>

6505 E Central Ave #254

Wichita, KS 67206-1924

316-285-0120

Thomas.M.Hermann@odonata-research.com

Career Objective To improve engineering productivity through proper application of state-of-the art methodology, analyses, and software.

Strengths

- Aeroelastic analysis and flight test with extensive transonic experience
- Structural dynamic testing and analysis
- Finite Element Analysis
- Engineering software development in Matlab, Python, Fortran, & Common Lisp

Experience

Aerospace Engineer (November 2007 - Present) : Performed flutter and dynamic loads analysis of a business jet modified with wing and fuselage stores. Performed flutter and dynamic loads analysis of a passenger to freighter conversion of a transport aircraft. Performed static and dynamic loads analysis of a twin turboprop, carrier based, AEW aircraft using both customer proprietary and Nastran aeroelastic models. Performed modernization and enhancement of the customer proprietary 6DOF simulation code, balanced loads code, and doublet-lattice code. Performed CFD to generate a loads aerodynamic database for a clean-sheet regional jet. Collaborated with a commercial software vendor to develop and demonstrate an innovative nonlinear aeroelastic analysis. Performed evaluation of Stanford University Unstructured CFD code for a client, building and debugging the software on both a workstation and HPC cluster.

Performed structural dynamic, aeroelastic, and dynamic loads analysis of the *Learjet 70/75* on a contract basis. Utilized both customer proprietary and Nastran aeroelastic models for the analysis. Wrote the test plans for the certification ground vibration and flight flutter testing. Documented compliance with 14 CFR Part 25.629.

Performed finite element analysis of wind turbine blades using ANSYS on a contract basis. Developed software to parametrically generate the finite element model input for ANSYS. Developed software to calculate the effective 3D orthotropic composite laminate properties from the 2D in-plane test data. Developed software to evaluate the composite laminate using the LaRC03 multi-mode failure criteria.

Research Associate (November 2003 - July 2006) : Through testing and finite element analysis, demonstrated the use of anisotropic carbon/glass hybrid composites in wind turbine blades to achieve twist bend coupling of the blades for passive load alleviation at the *National Institute for Aviation Research*. Demonstrated the use of hybrid composites in improving the shear web buckling characteristics of a composite I-beam representative of a wind turbine spar. Demonstrated the correlation between extension-shear coupling at the laminate level with bend-twist coupling at the blade level.

Structural Dynamics Analysis (May 1999 - October 2003) : Performed structural dynamic and aeroelastic analysis of aircraft and aircraft components at Raytheon Aircraft. *Flight Flutter Testing* - Performed telemetry monitoring and data reduction of flight flutter testing of a Part 25 aircraft. *Ground Vibration Testing* - Performed ground vibration testing and analysis of a Part 25 aircraft in support of aircraft certification. *Dynamic Loads Analysis* - Performed Part 25 dynamic loads analysis of the aircraft utilizing MSC.NASTRAN. Developed data reduction software that rapidly reduced and prepared the data for distribution. *Crash Dynamics* - Analyzed the crashworthiness of an aircraft seat subjected to a Type 2 dynamic impact seat certification test utilizing MSC.DYTRAN coupled with ATB-IV. Demonstrated correlation of the analysis with test data for head path, seat belt loads, contact timing and HIC. *Landing Gear Shimmy* - Improved the shimmy stability of a business jet nose gear through testing and analysis. *Buffet Induced Vibration* - Developed external modifications to reduce vibration of aft fuselage ventral fins. Characterized the dynamic behavior of the ventral fins utilizing the mode shapes obtained from a hammer test.

Aeroelastic Analysis (June 1997 - May 1999) : Evaluated and modified an unsteady transonic small disturbance aerodynamic code for flutter prediction of business jet configurations at the University of Kansas.

Aircraft Simulation (July 1997 - April 1999) : Developed simulation models, reviewed flight test data and performed proof of match analysis of aircraft simulations for Kolhman Systems Research.

Experimental Aerodynamics (Summer 1996) : Participated in the NASA Langley Aerospace Research Summer Scholars Program. Developed and validated a preliminary method for performing dynamic ground effect wind tunnel testing in the 14x22 ft wind tunnel.

Recognition

- 2001 Raytheon Corporate Meritorious Award for Excellence in Technology
- Recognition of Standout Performance, Outstanding Contribution and Dedication to First Flight, Raytheon Aircraft

Associations

Senior Member, American Institute of Aeronautics and Astronautics (AIAA)
Aircraft Owners and Pilots Association (AOPA)
Experimental Aircraft Association (EAA)

Education

Aerospace Engineering
M.S., University of Kansas, December 1999
B.S., University of Kansas, May 1997

References

Available upon request.