



Juan J. Alonso

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Background

Career highlights:

- Professor, [Department of Aeronautics & Astronautics, Stanford University](#), 2015-present.
- Associate Professor, [Department of Aeronautics & Astronautics, Stanford University](#), 2004-2015.
- Director, [Fundamental Aeronautics Program Office, NASA Headquarters](#), 2006-2008.
- Assistant Professor, [Department of Aeronautics & Astronautics, Stanford University](#), 1997-2004.
- Ph.D., [Mechanical & Aerospace Engineering, Princeton University](#), 1997.
- M.A., [Mechanical & Aerospace Engineering, Princeton University](#), 1993.
- B.S., [Aeronautics & Astronautics, MIT](#), 1991.

You can find a more detailed version of my CV [here](#).

Research Interests

The work in our group is focused on research and development of new high-fidelity, multidisciplinary methods and techniques for the analysis and design of complex aerospace systems. The focus is on the development of the methods *and* their use in realistic test cases in order to assess their value. In the past, our research has involved transonic, supersonic, and hypersonic aircraft, helicopters, turbomachinery, and launch and re-entry vehicles. Current research topics of interest in the group include:

- High-fidelity computational analysis of multiple disciplines (fluid mechanics, structures, acoustics, etc.)
- Advanced methodologies for treatment of multi-disciplinary design.
- Multi-fidelity/variable-fidelity techniques for aerospace design.
- Including uncertainties in the analysis and design process (UQ and robust design).
- System-level analysis / assessment of technology benefits.
- Design of very advanced aircraft able to meet the challenges of the NextGen.

Teaching

Below you can find links for the courses that I have taught since the Winter Quarter 2009

- [AA100 - Introduction to Aeronautics & Astronautics](#)
- [AA200 - Applied Aerodynamics](#)
- [AA210b - Fundamentals of Compressible Flow II](#)
- [AA222 - Introduction to Multidisciplinary Design Optimization](#)
- [AA241a - Introduction to Aircraft Design, Synthesis, and Analysis](#)
- [AA241X - Design, Construction, and Testing of Autonomous Aircraft](#)
- [AA260 - Sustainable Aviation](#)
- [CME342 - Parallel Methods in Numerical Analysis](#)

Recent Publications









A detailed list of publications can be found [here](#). PDF versions will be added soon.

2009








Palaniappan, K., Sahu, P., Alonso, J.J., Jameson, A., "Design of Adjoint-Based Laws for Wing Flutter Control," 47th AIAA Aerospace Science Meeting & Exhibit, AIAA Paper 2009-148, Orlando, FL, January 2009.


2008

-  Colonno, M. R., van der Weide, E., and Alonso, J. J., "The Optimum Vacuum Nozzle: an MDO Approach," 47th AIAA Aerospace Science Meeting & Exhibit, AIAA Paper 2009-911, Orlando, FL, January 2009.
-  Mader, C., Martins, J., Alonso, J. J., and van der Weide, E., "ADjoint: An Approach for the Rapid Development of Discrete Adjoint Solvers," AIAA Journal, vol. 46, no. 4, pp. 863-873, April 2008.
-  Choi, S., Alonso, J. J., Kroo, I. M., and Wintzer, M., "Multifidelity Design Optimization of Low-Boom Supersonic Jets," AIAA Journal, vol. 45, no. 1, pp. 106-118, January-February 2008.
-  Choi, S., Potsdam, M., Lee, K., Iaccarino, G., and Alonso, J. J., "Helicopter Rotor Design Using a Time-Spectral and Adjoint-Based Method," AIAA Paper 2008-5810, 12th AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference, Victoria, British Columbia, September, 2008.
-  Colonno, M., Reddy, S., and Alonso, J. J., "Multi-Fidelity Trajectory Optimization with Response Surface Based Aerodynamic Performance Prediction," AIAA Paper 2008-0218, 46th Aerospace Sciences Meeting & Exhibit, Reno, Nevada, January 2008.
-  Alonso, J. J., Hahn, S., Ham, F., Herrmann, M., Iaccarino, G. and van der Weide, E., "CHIMPS: A High- Performance Scalable Module for Multi-Physics Simulations," AIAA Paper 2006-5274, 42nd AIAA/ASME/SAE/ASEE Joint Propulsion Conference & Exhibit, Sacramento, CA, July 2006.
-  Marta, A. C., Alonso, J. J., "Discrete Adjoint Formulation for the Ideal MHD Equations," 3rd AIAA Flow Control Conference, AIAA Paper 2006-3345, San Francisco, CA, June 2006.
-  van der Weide, E., Kalitzin, G., Schluter, J., Alonso, J.J., "Unsteady Turbomachinery Computations Using Massively Parallel Platforms," 44th AIAA Aerospace Sciences Meeting and Exhibit, AIAA Paper 2006-0421, Reno, NV, January 2006.


2007

-  Nelson, A., Alonso, J. J., and Pulliam, T. H., "Multi-Fidelity Aerodynamic Optimization Using Treed Meta-Models," AIAA Paper 2007-4057, 25th AIAA Applied Aerodynamics Conference, Miami, FL, June 2007.
-  Choi, S., Alonso, J. J., van der Weide, E., and Sitaraman, J., "Validation Study of Aerodynamic Analysis Tools for Design Optimization of Helicopter Rotors," AIAA Paper 2007-3929, 25th AIAA Applied Aerodynamics Conference, Miami, FL, June 2007.
-  Medic, G., Kalitzin, G., You, D., van der Weide, E., Alonso, J. J., and Pitsch, H., "Integrates RANS/LES Computations of an Entire Gas Turbine Jet Engine," AIAA Paper 2007-1117, 45th Aerospace Sciences Meeting & Exhibit, Reno, Nevada, January 2007.
-  Kalitzin, G., Medic, G., van der Weide, E., and Alonso, J. J., "Interaction of Turbomachinery Components in Large-Scale Unsteady Computations of Jet Engines," AIAA Paper 2007-0519, 45th Aerospace Sciences Meeting & Exhibit, Reno, Nevada, January 2007.
-  Gopinath, A., van der Weide, E., Alonso, J. J., Jameson, A., Ekici, V., and Hall, K., "Three-Dimensional Unsteady Multi-Stage Turbomachinery Simulations Using the Harmonic Balance Technique," AIAA Paper 2007-0892, 45th Aerospace Sciences Meeting & Exhibit, Reno, Nevada, January 2007.

2006

-  McMullen, M., Jameson, A., and Alonso, J.J, "Demonstration of Nonlinear Frequency Domain Methods," AIAA Journal, vol. 44, no. 7, pp. 1428-1435, July 2006.

2005

-  Davis, R. L., Alonso, J.J, Yao, J., Paolillo, R., and Sharma, O. P., "Prediction of High-Pressure Turbine Main-/Secondary-Air System Flow Interaction," AIAA Journal of Propulsion and Power, vol. 21, no. 1, pp. 158-166, January-February 2005.

2004

- Kim, S., Alonso, J.J, Jameson, A., "Multi-Element High-Lift Configuration Design Optimization Using a Viscous Continuous Adjoint Method," AIAA Journal of Aircraft, vol. 41, no. 5, pp. 1082-

1097, September-October 2004.



Martins, J. R. A., Alonso, J.J, and Reuther, J. J., "High-Fidelity Aerostructural Design Optimization of a Supersonic Business Jet," *AIAA Journal of Aircraft*, vol. 41, no. 3, pp. 523-530, May-June 2004.
