

Blast-Response of Structures



Roger L. Veldman
Engineering
veldman@hope.edu
(616) 395-7154

Education and Experience

Ph.D., Mechanical Engineering, Western Michigan University (2001)
M.S.E., Mechanical Engineering, Western Michigan University (1995)
B.S., Engineering Science, Hope College (1989)
Hope College, Associate Professor (1998-present)
Product Development Engineer, Donnelly Corporation, (1991-1998)

Research Interests

Dynamic response of structures, Blast and Impulse-loading of structures, Aviation security, Aircraft hardening, Finite Element Analysis

Grants and Awards

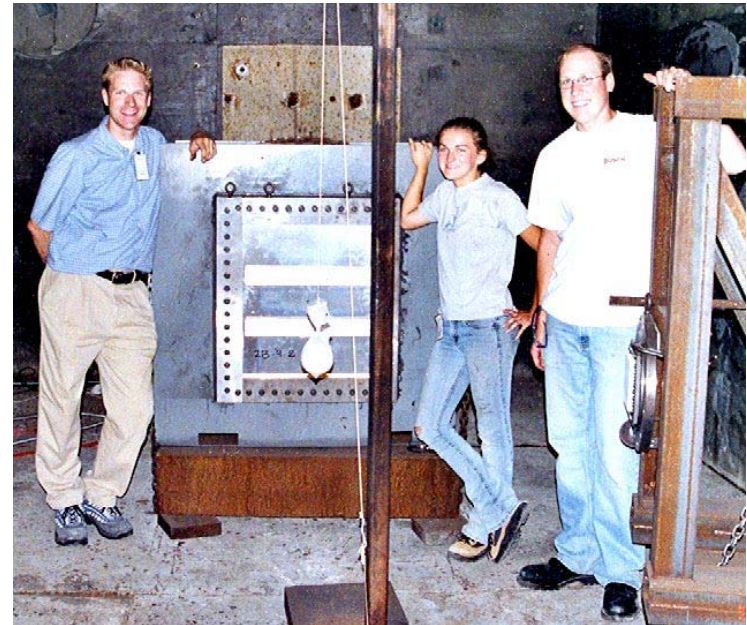
- Michigan Space Grant Consortium-Research Seed Grant: Experimental Evaluation of Blast Mitigating Materials for Aircraft Structures, (\$10,000)(2005)
- Transportation Security Administration: An Investigation of the Effects of Pre-pressurization on Explosive Damage of a Reinforced Aluminum Shell, (\$102,000)(2004-2005)
- Federal Aviation Administration – An Investigation of the Effects of Pre-pressurization on Explosive Damage of a Clamped Aluminum Plate,” \$102,000 (2002-2003).

Key Publications and Presentations

- R.L. Veldman, J. Ari-Gur, C. Clum, “Effects of Pre-Pressurization on Damage of Blast-Loaded Reinforced Plates” ASME International Mechanical Engineering Congress and Exposition, Orlando, Florida, November, 2005.
- R.L.Veldman, et.al., “Effects of Pre-pressurization on Blast Response of Clamped Aluminum Plates”, International Journal of Impact Engineering, (2005)
- R.L.Veldman, et.al., “Effects of Pre-Pressurization on Plastic Deformation of Blast-Loaded Square Aluminum Plates”, 8th International LS-DYNA Users Conference, (2004)
- Co-inventor on 30 United States Patents

Research Description

This research project involves experimental and numerical studies of blast-loaded structures. Under grant funding from the Federal Aviation Administration (FAA) in 2002-2003 and the Transportation Security Administration (TSA) in 2004-2005, tests have been conducted aircraft fuselage skin materials under explosive loading conditions. Additionally, numerical simulations of blast-loaded structures have been carried out using the commercially available finite element software ANSYS/DYNA.



Roger Veldman and student researchers Courtney Clum and Greg Huizen Conducting Blast Testing at Battelle Memorial Institute in Columbus, Ohio.

Acknowledgements

