

Project 2 Validation and Integration of Numerical simulations and Experiments (VINES)

Objectives

The principal objective of this project is to develop guidelines and a standard methodology for the comparison of experimental strain and deformation measurements to numerical simulations of cyclic, transient and non-linear dynamic events. To this aim the project will cover the following areas:

- Development of suitable reference materials that allow traceability and calibration of full-field optical methods under dynamic conditions
- Optimisation of methodologies for both optical measurement and computational modelling and simulation
- Create draft documentation for Submission to ISO as a TTA.

It is planned to link with the EU funded project Advanced Dynamic Validations using Integrated Simulation and Experimentation – ADVISE (see www.dynamicvalidation.org) under the 7th Framework Programme to disseminate its output and provide a forum for the standardization aspects.

Background and Standardization Needs

The previous SPOTS project produced a draft standard document covering calibration and evaluation of full field optical methods for strain measurement. This project dealt with standards for the calibration of static test measurements and it was felt that the development of techniques suited to dynamic calibration would benefit the increased requirement for dynamic testing. This requirement has arisen from the continual increase in the need for safer and more reliable forms of transport.

Crash and impact testing is of major importance during the evaluation of a vehicle's ability to survive a collision and maximise occupant survival. The production of standards for impact assessments will be of great benefit in this area of industrial activity as it will provide a consistent basis for measurement and comparison with simulation.

Work Programme

- Evaluation of Advanced Tools for Simulation & Experimentation
- Assessment of Dynamic Calibration Methods and systems

Call for Participation

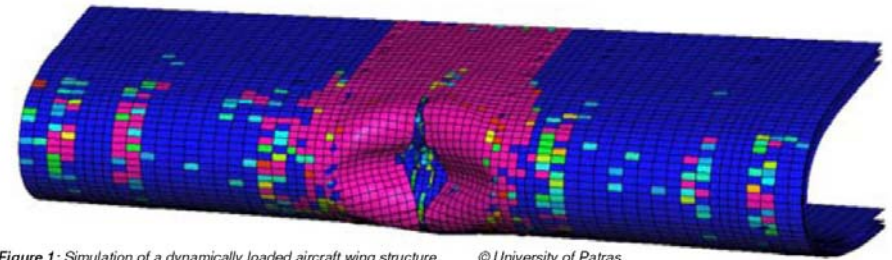


Figure 1: Simulation of a dynamically loaded aircraft wing structure © University of Patras



Figure 2: The video images show a typical bird impact on a generic or idealised leading edge aircraft structure. Tests were performed to 'calibrate' a numerical model of the test event. This approach enables certification of leading edge structure based on validated models rather than tests using expensive aircraft test sections. © Airbus 2009

- Experimental Validation by Case Studies

Deliverables and Dissemination

- Evaluate and feedback on methods developed by the ADVISE project for experimental measurement calibration and validation of numerical simulations of dynamic events,
- Draft document for consideration as a Technology Trend Assessment (TTA).
- Liaison with organizations that have interests in the subject of Simulation and Experimentation (NAFEMS, BSSM, SEM, etc.)

- Conferences, specialist workshops, discussion forums

Status

Approved for startup. Additional participants welcome.

For more information on participation, please contact:

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