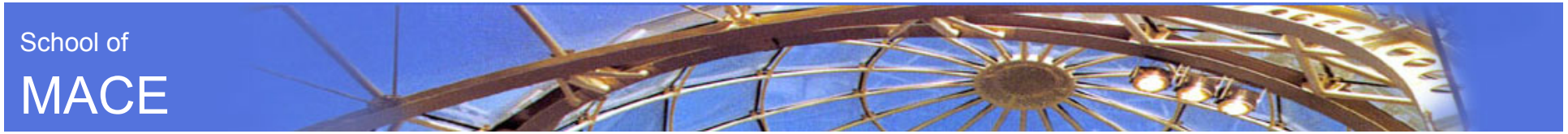
MANCHESTER 1824

The University of Manchester

# UMARI – Non Destructive Testing

## Vibration Testing and System Identification

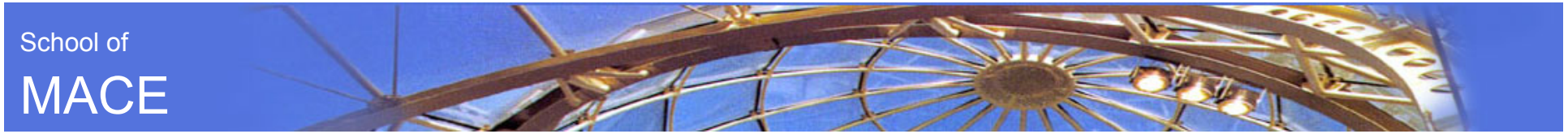
By G. Dimitriadis - DARG



School of MACE

# About DARG

- Dynamics and Aeroelasticity Research Group
- 5 Academic members of Staff
- 30+ Postdoctoral and postgraduate researchers
- Research Areas:
  - Structural Vibrations
  - Aeroelasticity
  - Damping
  - Human-Structure Interaction
  - Smart Materials/Structures



# Vibration Testing

- Modal Testing
  - Multi-Shaker Techniques
  - Aircraft Ground Vibration Testing
  - Flight Flutter Testing
- Vibration Measurement of Bladed Assemblies
  - Blade Tip Timing Systems
  - Data Analysis for Blade Tip Timing Systems
  - Aero Engine Health Monitoring Using Blade Tip Timing
- Fatigue and Acoustic Loading
  - Acoustic Loading of Aircraft Panels
- Vibration Testing of Metal Detectors & MRI Scanners
- Human Induced Dynamics Loads on Structures

# Nonlinear System Identification

- Force Appropriation for Nonlinear Systems
  - Nonlinear Resonant Decay Method
- Constant Level Identification
- Applications to Aircraft Ground Vibration Testing
- Nonlinear Flight Flutter Tests
- Expert System for Identification of General Nonlinear Systems

# Recent Major Projects

- PUMA DARP: Effects of nonlinear unsteady aerodynamics to aircraft aeroelastic behaviour. Partners: BAE Systems, Airbus UK, QinetiQ, Bristol, Glasgow
- 3AS: Active Aeroelastic Aircraft Structures. Partners: EADS, Alenia, CASA, Saab, DLR, TsAGI and others
- Blade Tip Timing: Continuous research effort since 1998. Partner: Rolls-Royce PLC.
- Numerous EPSRC Grants