

## Research Project

# INTEGRATED WING WORK PACKAGE 3.3



### Motivation

The Integrated Wing Technology Validation Programme is a national collaboration project among 17 UK leading organizations. The project aims to strengthen and accelerate the UK aircrafts technologies by addressing challenges such as the development, production and maintenance costs, lower fuel consumption, emissions and noise.

### University of Bath involvement

The University of Bath is involved in the Integrated Wing Work Package 3.3, together with Airbus, the System Engineering Innovation Centre (SEIC) and Eaton Aerospace. The work package focuses on fault diagnosis for aircraft fuel systems. A SIMULINK-based generic aircraft fuel system model has been developed at Bath. This includes various sub-models such as pipelines, valves, boost pumps, jet pumps and fuel tanks. Water hammer and cavitation models are being developed such that they can be integrated with the full aircraft fuel system model. The model also features various simulated faults such as pump failures and fuel leakages. Initial simulations are producing good results.

### Future work

The model will be used in conjunction with Kalman filters, developed at SEIC, to test aircraft fuel leakage detection concepts. The simulation results will then be compared with data at Airbus and also validated experimentally at SEIC.



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