QUB - Mechanical and Aerospace Engineering PhD Project

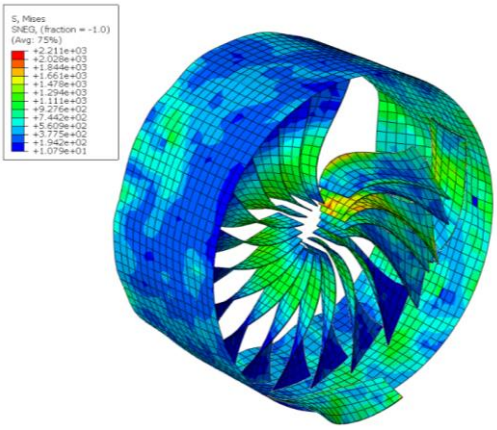
Title: Rapid approaches to assess power-plant loading for novel aircraft concepts under extreme events

Project description:

This project will be carried out within a large research team (including academics, PhDs and Post-Doctoral researchers) who conduct exciting and innovative research in collaboration with Rolls-Royce. It will investigate novel computational methods for modelling and assessing the impact of extreme events on current and future power-plant and aircraft design concepts.

When designing aerospace systems a significant amount of effort is often expended in assessing designs against extreme events [such as blade loss or edge of envelope scenarios], often resulting in significant changes to concepts or in some cases rendering them unrealisable. These events are often extremely challenging to assess, requiring a large amount of background information and the use of complex analysis techniques which are unsuited to early design timescales. This PhD will review a number of these conditions, identify those which could be more readily assessed with light-weight techniques and develop and evaluate prototype analysis tools. These should allow for earlier review of the implications of these events on candidate designs and concepts.


SWA1380, Image:tailstrike.com



Aims and Objectives:

The aim is to understand the influence of extreme aircraft events on the design of current and future engine and aircraft design concepts. This will be met through the following objectives:

1. Understand aircraft and power-plant extreme event design requirements, and the methodologies used to meet them.
2. Determine the influence of these events on existing designs.
3. Investigate and develop methods for evaluation of future designs suitable for concept design stages.
4. Use newly developed methods to evaluate performance of leading design options.

Key skills required for the post:

Key transferable skills that will be developed during the PhD:

Lead supervisor (s):	Dr D Nolan (d.nolan@qub.ac.uk), Dr T Robinson (t.robinson@qub.ac.uk), Prof. A Murphy (a.murphy@qub.ac.uk)
Other supervisor(s):	
Guaranteed stipend:	£18,500

Conditional top-up available:	
PhD students in the School have the opportunity to apply to be demonstrators on undergraduate modules. Compensation for this can amount to in excess of £2,400 per year.	

Queens University Belfast is a diverse and international institution which is strongly committed to equality and diversity, and to selection on merit. Currently women are under-represented in research positions in the School and accordingly applications from women are particularly welcome.