



**Scenario**  
DOCTORAL TRAINING PARTNERSHIP

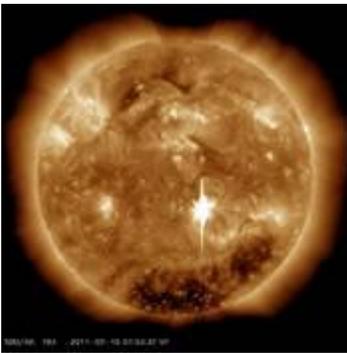
**NERC**  
SCIENCE OF THE  
ENVIRONMENT

## **In-Flight Atmospheric Radiation Observations for Space Weather Risk Monitoring**

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Solar storms can create sudden increases in ionizing radiation at typical flight altitudes leading to the risk of malfunctions in aircraft microelectronic systems and unquantified radiation dose to passengers and crew. In extreme cases there is the risk of an 'ash cloud' scenario where aircraft may have to be grounded or diverted. To-date in-flight observations of this radiation have been extremely sparse due to very limited flight opportunities for the relevant instruments. This project, supported by the Met Office, Public Health England and NPL, combines new technology using solid-state radiation detectors, smart phones and satellite applications to enable a revolutionary increase in the number of observations of atmospheric radiation at flight altitude. The aim of the project is to develop and prove in a number of flight-trials a miniaturized detector which can be issued to co-operating passengers and crew members to operate with their smart phone or tablet during a flight to record the radiation environment. The data will be downloaded via the web on landing or en-route. Flight trials on Met Office and commercial aircraft will be carried out and data analysed as the first step towards a new and unique system of global observations of a key space weather hazard.



### **Training opportunities:**

The student will undertake a placement (4 months) with the Met Office to test the new system on their research aircraft and develop applications. Time will also be spent with NPL (for calibrations), Public Health England (to investigate public health applications) and Solarmetrics Ltd (airline liaison).

### **Student profile:**

This project is ideal for students with a good degree in Physics or Electronic Engineering who have a keen appetite for working on environmental observations and instrumentation. The student should have an aptitude for practical experimental work. An interest in aerospace and modern mobile information technology is beneficial.

### **Funding particulars:**

This project has CASE co-funding from the Met Office including provision of aircraft flights for system trials and a placement of 4 months to conduct the trial.

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