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CRANFIELD ASTROBIOLOGICAL STRATOSPHERIC SAMPLING EXPERIMENT (CASS●E):
OVERALL PERFORMANCE OF THE EXPERIMENT DURING FLIGHT AND PARTICLE
COLLECTION FILTER ANALYSIS**Abstract**

The Cranfield Astrobiological Stratospheric Sampling Experiment (CASS●E) was an experiment which used two pumps to draw air from the Earth's Stratosphere through collection filters in order to perform post-flight detection and characterisation of any collected microorganisms. It was flown on-board the BEXUS-10 and BEXUS-11 stratospheric balloon flights in October and November 2010 from Esrange, Sweden, as part of the Balloon-borne EXperiments for University Students (BEXUS) program. Due to the low density of microorganisms expected in the Stratosphere compared to the levels of microorganisms present during pre- and post-flight ground handling and tropospheric ascent and descent, the design implementation included multiple steps to minimise contamination of the samples. Therefore, the experiment incorporated Planetary Protection and Contamination Control (PPCC) protocols which included Space-qualified cleaning and sterilisation techniques employed throughout the experiment Assembly, Integration and Testing (AIT). Most importantly, the experiment's inlet tubes were protected by bio-barrier mechanisms that would only open upon arrival to the Stratosphere, thus ensuring that any particles collected would be truly stratospheric. During the BEXUS-10 flight a malfunction in the bio-barrier mechanisms impeded pumping stratospheric air; however, the BEXUS-11 flight was successful and particles were collected. This report presents the overall performance of the experiment during flight and the preliminary results of the analysis of the material collected on the particle filters.