

56th IAA SYMPOSIUM ON SAFETY, QUALITY AND KNOWLEDGE MANAGEMENT IN SPACE
ACTIVITIES (D5)

Predicting, testing, and measuring the effects of the space environment on space missions (3)

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Delft Aerospace Rocket Engineering (DARE), The Netherlands, v.kristina1710@gmail.comENVIRONMENTAL TESTING OF SHEAR HEAT SHIELD EXPERIMENT: A STUDENT-LED
VENTURE TOWARDS ADVANCED ROCKETRY**Abstract**

SHEAR (Supersonic Heatshield Experiment Aboard REXUS) is an experiment of one of the most advanced student rocketry societies that aims to flight-prove alginate and montmorillonite nanocomposite foam, a self-developed heat shield material. From prior on-ground testing, this material is known to withstand high thermal loads, which makes it suitable as a thermal protection system for sounding rocket flight conditions. The upgraded heat shield aims to expand the flight envelope of existing and future sounding rockets of the student society. SHEAR aims to increase the technology readiness level of the novel composite foam by integrating samples into a flight-ready configuration. The experiment consists of five samples integrated into a sounding rocket and will gather temperature data during the flight. The collected data will be compared with on-ground tests and simulations during post-flight analysis. Additionally, valuable data on the usability of this material as a heat shield on sounding rockets will be generated throughout the course of this experiment. The experiment will fly aboard the REXUS 32 rocket as part of the German-Swedish programme REXUS/BEXUS which allows students from universities and higher education colleges across Europe to carry out scientific and technological experiments. During the launch, and throughout the flight, the experiment may undergo extreme vibrational loads. In order to ensure that the experiment is safe, reliable, and capable of achieving its goals, the experiment will be tested in the CubeSat Support Facility at ESEC, Redu, Belgium. The focus of this paper is on the student experience and knowledge gained while conducting environmental testing at an industrial level.