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Analysis of the Spread Across Liquid-5 (Sal-5) Experiment Failure to Fill Properly During Flight

By -

Bibliogov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 36 pages. Dimensions: 9.7in. x 7.4in. x 0.1in. When a pool of flammable liquid is ignited, the flame spread rate can vary widely depending on the initial fuel temperature, pool geometry, ambient atmospheric conditions, and gravitational level. There is substantial decades-old debate in the scientific literature about the role of gravity in these phenomena. The objective of the research was to measure ignition and flame spread across liquid pools in both normal and microgravity with and without forced airflow, and to obtain detailed thermal and velocity field data for comparison to a predictive numerical model that is concurrently being developed. To that end, an experiment known as Spread Across Liquids 5 (SAL 5) was designed to be conducted in a low-gravity environment on a sounding rocket. Unfortunately, during the sounding rocket flight the fuel tray for the experiment failed to fill properly prior to ignition. The primary cause of the failure to fill properly is the geometry of the fuel tray; that is, the presence of the gaps on the side walls and the sharp edge around the thermocouple through-holes. The contamination resulting from the cleaning process is a...



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