FLIGHT CALIBRATION SOURCE DEVELOPMENT

by

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An important element in monitoring the sensitivity of flight instrumentation throughout a flight is a reliable reference. Tungsten filament quartz halogen and deuterium uv sources have been tested for this purpose. All three types were obtained from available commercial supplies and were tested against various mission requirements, particularly long-term stability characteristics. Stability tests were made before and after thermal vacuum and vibration tests.

A lamp assembly for SSBUV flight has been completed. Design of an integrating sphere to house the lamps and optics to transfer light from the flight sources into the Shuttle-borne SBUV (SSBUV) field of view for in-flight stability checks has been completed. The transfer optic element is a mirror 4-inches in diameter with a 5-inch radius of curvature. The mirror is mounted on the Get-Away-Special (GAS) canister lid, and the integrating sphere is mounted on the SSBUV instrument top deck. Our current analysis indicates that a 45-watt tungsten filament lamp mounted in the integrating sphere will provide as much energy for instrument stability checks as a 100 watt calibrated tungsten filament standard lamp in the laboratory provides for system calibrations.

The lamp assembly was tested in-house, and included a ray trace analysis. The multiple lamp sources will provide redundant and duplicative measurement to check system degradation.