SOFIA Telescope Assembly Activated In Flight

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NASA's SOFIA 747SP is trailed by a NASA F/A-18 safety chase plane during a recent test of the flying observatory's telescope cavity door opening mechanism. Engineers tested the telescope assembly's control and operation during a door-closed telescope assembly activation flight test Jan. 15. (NASA Photo / Carla Thomas)

(PhysOrg.com) -- NASA's Stratospheric Observatory for Infrared Astronomy successfully completed telescope assembly activation during an almost six-hour test flight Jan. 15.

Functions such as movement and stability of the telescope were examined using the telescope's control system software. The telescope cavity door was not opened because these particular tests did not require pointing the telescope at objects in the sky.

The primary goal of the testing, according to SOFIA engineers, was to prove that the telescope assembly is able to achieve inertial stabilization. Often called gyroscopic stabilization, inertial stabilization enables the telescope to continually point at a celestial object while the aircraft maneuvers in flight.

The telescope was unlocked by engineers from SOFIA's German telescope partners, Deutsches SOFIA Institute, and allowed to "float" as it would during astronomical observations. The time required to lock and unlock the assembly during flight was greatly reduced from previous tests. The vibration isolation system was also monitored to determine if the assembly remained centered on its mount as the aircraft changed its altitude and heading.

Engineers monitored temperature changes to see how they affected operation and performance of the telescope assembly, including the secondary mirror mechanism. The temperature of the telescope components inside the cavity drops gradually while flying at altitude because the cavity is not sealed from the outside atmosphere. With the door closed, the telescope cavity did not become quite as cold during this flight as it will with the door open, but the flight provided an opportunity to watch how the temperature dropped, finally reaching -15 degrees Celsius (+5 degrees Fahrenheit), as the aircraft flew at 35,000 feet.

The flight Jan. 15 followed a check flight the preceding day when a number of aircraft functional tests were accomplished.

Additional in-flight testing of telescope functions with the telescope cavity door open is planned in coming weeks.

Provided by JPL/NASA