Jason-3

ADVANCED MICROWAVE RADIOMETER – 2 (AMR-2)

Background

The Advanced Microwave Radiometer – 2 (AMR-2) measures altimeter signal path delay due to tropospheric water vapor.

The AMR-2 consists of two subsystems: ESA (Electronics Structure Assembly) and RSA (Reflector Structure Assembly).

The AMR-2's design is similar to the Jason-2 instrument but with improvements to the instrument thermal control and stability.

Benefits

The AMR measures water vapor content in the atmosphere to determine how atmospheric moisture affects radar signal propagation. Its measurements can also be used directly for studying other atmospheric phenomena, particularly rain.

AMR-2 Instrument-at-a-Glance

Purpose: To measure altimeter signal path delay due to atmospheric water vapor.

Instrument Contractor:
ESA developed by JPL; RSA is developed by ATK Space Systems, San Diego, Calif.

Website:
http://www.nesdis.noaa.gov/jason-3/spacecraft.html

Key Measurements

AMR-2 is a passive microwave radiometer that measures radiation from Earth's surface (brightness temperatures) at three frequencies (18.7, 23.8, and 34 GHz). These different measurements are combined to determine atmospheric water vapor and liquid water content. Once the water content is known, it is possible to determine the correction to be applied to the altimeter for radar signal path delays (the brightness temperatures are converted to path-delay information).

Radiation measured by the radiometer depends on surface winds, ocean temperature, salinity, foam, absorption by water vapor and clouds, and various other factors. To determine atmospheric water vapor content accurately, sea surface and cloud contributions from the signal received by the radiometer must be eliminated. The AMR-2 uses different frequencies, each of which is more sensitive than the others to one of these contributions. The 23.8 GHz channel is the primary water vapor sensor, the 34 GHz channel provides a correction for non-raining clouds, and the 18.7 GHz channel provides the correction for effects of wind-induced enhancements in the sea surface background emission.