

WIDE-SWATH ALTIMETRIC MEASUREMENT OF OCEAN SURFACE TOPOGRAPHY

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This paper describes a new approach to making altimeter measurements from off-nadir radar signal returns and its scientific and operational applications. The approach is based on the technique of radar interferometry and the new instrument is called the Wide-Swath Ocean Altimeter (WSOA). WSOA is designed to be flown with a Jason-1 class conventional dual-frequency altimeter system, including a multi-frequency radiometer for the correction of the effects of water vapor in the troposphere. WSOA will extend the measurement from a line along the nadir to a swath of 200 km centered on the nadir track. The most important application of WSOA is to provide the first synoptic maps of the global oceanic eddy field. The strong currents and water property anomalies (in temperature, salinity, oxygen, etc.) associated with ocean eddies are a major factor affecting the oceanic general circulation and maritime operations such as offshore oil drilling, ship routing, fisheries, marine debris dispersion, etc. WSOA is expected to be an essential part of the future ocean observing system for addressing these applications. WSOA will also provide measurements that allow the monitoring and study of coastal currents and tides that affect the lives of half of the world's population.