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## Ocean wave spectra estimation with the Earth Explorer 10 candidate Harmony

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Tropical cyclones are commonly linked to devastation by hurricane-force winds, storm surges and rainfall. They are also responsible for large exchanges of heat in the upper ocean and the atmosphere, and the transport of large quantities of water from ocean to land. Due to the limited coverage of microwave observations from airplanes and the limited resolution of spaceborne scatterometers, the dynamics inside these extremes are poorly sampled and understood. Synthetic Aperture Radar (SAR) overcomes these limitations, but is only able to recover one-dimensional information, which limits the accuracy of estimated quantities like wind speed, total surface current and wave spectra. Waves radiating outward are, during their development, affected by wind and currents inside of the tropical cyclone and therefore contain information about the structure and dynamics of the system. Wave spectra in tropical cyclones can only partly be recovered, as the quickly changing sea surface limits the resolution of SAR in the azimuth direction. This presentation shows the benefit of having Harmony's bi-static receivers flying in a StereoSAR configuration with Sentinel-1D for the retrieval of wave spectra. Harmony's data allows for the retrieval of a larger fraction of the wave spectra. In the periphery of tropical cyclones Harmony will primarily enhance the recovery of medium-length (100-300 m) swell and wind waves, while Harmony also improves the recovery of long (swell) waves (>200 m) near the eye of the storm.