Level 4 data from the Wide Swath Radar Altimeter (WSRA) obtain during ATOMIC

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This directory contains files of summary (Level-4) data from the WSRA obtained on flights by the NOAA P3 during the ATOMIC field campaign. The files were obtained from https://www.prosensing.com/atlantic-tradewind-ocean-atmosphere-mesoscale-interaction-campaign-atomic/ in July 2020 and modified slightly to add metadata consistent with the ATOMIC and EUREC4A archives.

The files contain the following variables, grouped according the :

WSRA data products:

directional_wave_spectrum contains all (Level 4) directional ocean wave spectra from the flight. The artifact spectral lobes have been deleted in the Level-4 spectra and the real spectral lobes have been Doppler-corrected for the motion of the waves during the data acquisition interval and variance-corrected for distortions in the wave topography measured by the WSRA. Variance values are in m2.
directional_wave_spectrum_180 contains directional wave spectra containing both real and artifact spectral lobes which have been Doppler-corrected and variance-corrected.
dominant_wave_direction is the propagation direction of the dominant wave field in degrees.
dominant_wave_height is the significant wave height of the ocean dominant wave field in meters.
dominant_wave_wavelength is the peak wavelength of the ocean dominant wave field in meters.
peak_spectral_variance is the peak spectral variance in m2 of the Level 4 directional ocean wave spectra.
rainfall_rate - five independent values of rain rate (mm/hr) determined at -20, -10, 0, 10, 20 s displacements relative to the observation time.
rainfall_rate_median - median value of the 5 values in rainfall_rate.
sea_surface_mean_square_slope - five independent values of mean square slope (mss) determined at -20, -10, 0, 10, 20 s displacements relative to the observation time.
sea_surface_mean_square_slope_median - median value of the 5 values in sea_surface_mean_square_slope
sea_surface_wave_significant_height (SWH) in meters.
secondary_wave_direction is the propagation direction of the secondary ocean wave field in degrees, if one exists.
secondary_wave_height is the significant wave height of the secondary ocean wave field in meters, if one exists.
secondary_wavelength is the peak wavelength of the secondary ocean wave field in meters, if one exists.
wsra_computed_roll is average WSRA computed roll determined at -20, -10, 0, 10, 20 s displacements relative to the observation time.

WSRA processing parameters:

dominant_to_secondary_partition_angle indicates the North relative angle as boundary between the dominant and secondary wave fields if two have been identified.
wave_direction_predicted - predicted direction of propagation for eight wavelengths (366, 256, 197, 160, 135, 116, 102, 91 m) computed to aid in deleting artifact lobes
swh_correction_ratio – ratio of the corrected SWH to the SWH estimated from WSRA Level-2 data

Ancillary data: (variable names are highlighted in boldface):

time is the time of the observation
latitude in degrees
longitude in degrees
platform_course is the North-relative aircraft track angle received from aircraft IWG1
platform_orientation is North-relative aircraft heading received from aircraft IWG1
platform_radar_altitude is the aircraft altitude determined by the WSRA.
platform_speed_wrt_ground is the aircraft ground speed received from aircraft IWG1
wind_direction – upwind direction at the aircraft altitude
wind_speed at the aircraft altitude
The files include two variables not used during ATOMIC:

hurricane_eye_distance_east is the distance east of the hurricane eye
hurricane_eye_distance_north is the distance north of the hurricane eye

Dimensions:

trajectory is an integer counter increasing monochromatically in time
wavenumber_east is the spectral wavenumber values along the east axis within +/- 0.08 rad/m
wavenumber_north is the spectral wavenumber values along the north axis within +/- 0.08 rad/m
wavelength holds eight discrete values of wavelength (366, 256, 197, 160, 135, 116, 102, 91 m) at which variable wave_direction_predicted is computed
obs holds the offsets -20, -10, 0, 10, 20 s time offset relative to the observation time.

For all additional clarification on the WSRA data products listed above and the rest of the parameters stored in the WSRA level-4 netCDF file, please contact Ivan Popstefanija at popstefanija@prosensing.com.