Monitoring intense oceanic fronts using sea surface roughness: Satellite, airplane and in-situ comparison

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Additional Supporting Information

1. Captions for Movies S1 to S4 (Files uploaded separately)

Introduction

Four movies are provided as supportive information on the drifters trajectories and surface roughness images.

Captions:

Movie S1 Trajectories of drifters (blue square, with a 1 hour tail) on February 10, 11 and 12. The two research vessels are shown in red and green. Also shown are the S1-a SAR image in VV polarization, the 7 MISR sunglint images and one airplane sunglint composite image.

Movie S2 Trajectory of drifter A (red square) between 09:00 UTC and 14:00 UTC. The frame of reference is defined by 9 other drifters (blue squares) already within the front. The front is supposed linear along the y-axis. Note the actual small curvature of front. The two dashed line show a distance of ±100 m to the front.

Movie S3 Same as previous movie but for the trajectory of drifter C (red square) between 14:30 UTC and 20:30 UTC. Here 6 other drifters are used to define the local frame of reference. Note a 7th drifter which most likely loses its drogue around 15:30 UTC and is pulled away by the wind.

Movie S4 Trajectories of 5 drifters (blue square, with a 15 min tail) on February 11 during 6 airplane passes over the front. The airplane ground position is shown in black and the instantaneous sunglint images are shown in grey scale. The pink contours (arrows) show the zenith (azimuth) angles of the surface slope making specular reflection between the sun and the airplane.

Captions with movie thumbnails:

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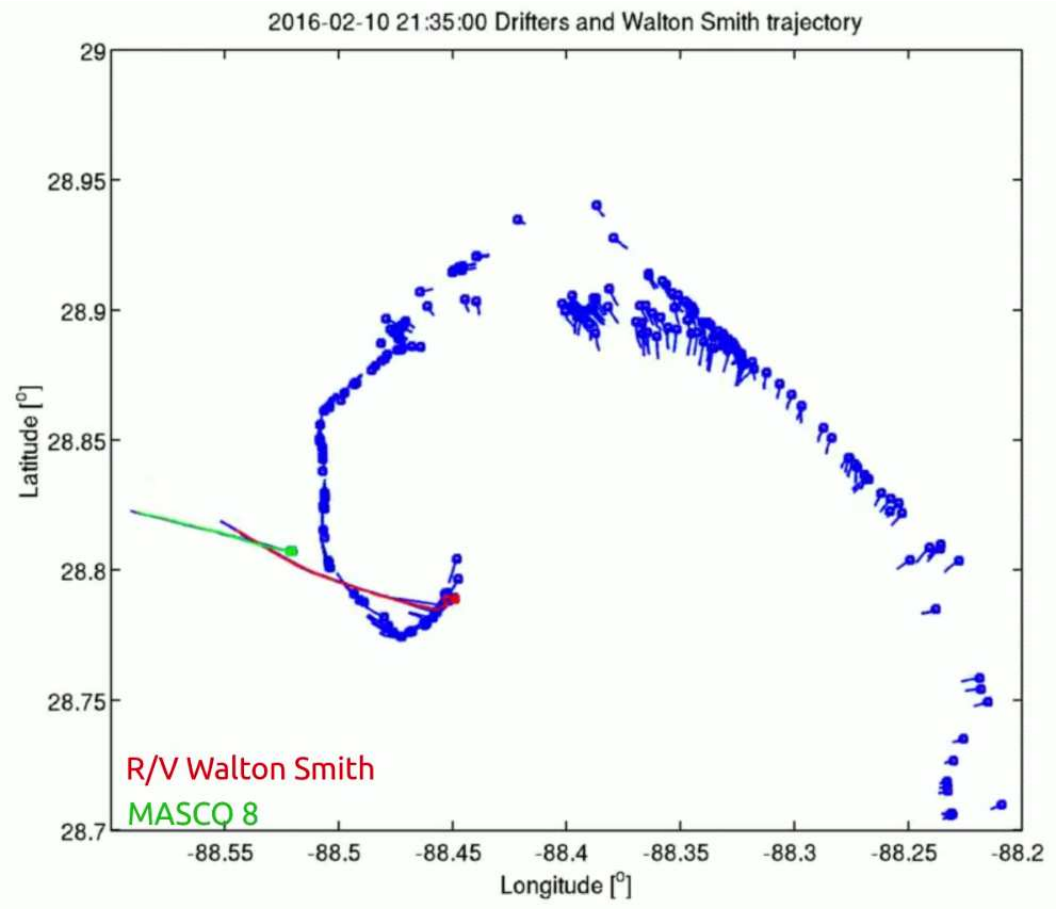

Figure 1. Movie S1 (File uploaded separately) Trajectories of drifters (blue square, with a 1 hour tail) on February 10, 11 and 12. The two research vessels are shown in red and green. Also shown are the S1-a SAR image in VV polarization, the 7 MISR sunglint images and one airplane sunglint composite image.

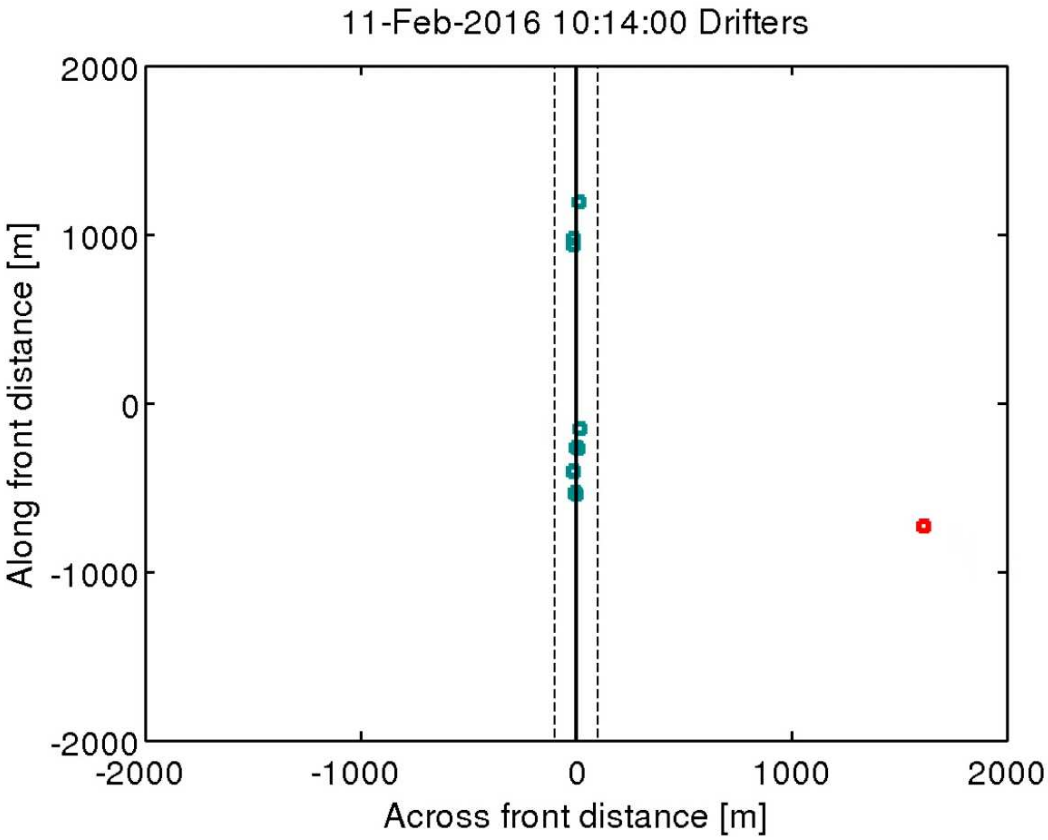

Figure 2. Movie S2 (File uploaded separately) Trajectory of drifter A (red square) between 09:00 UTC and 14:00 UTC. The frame of reference is defined by 9 other drifters (blue squares) already within the front. The front is supposed linear along the y-axis. Note the actual small curvature of front. The two dashed line show a distance of ±100 m to the front.

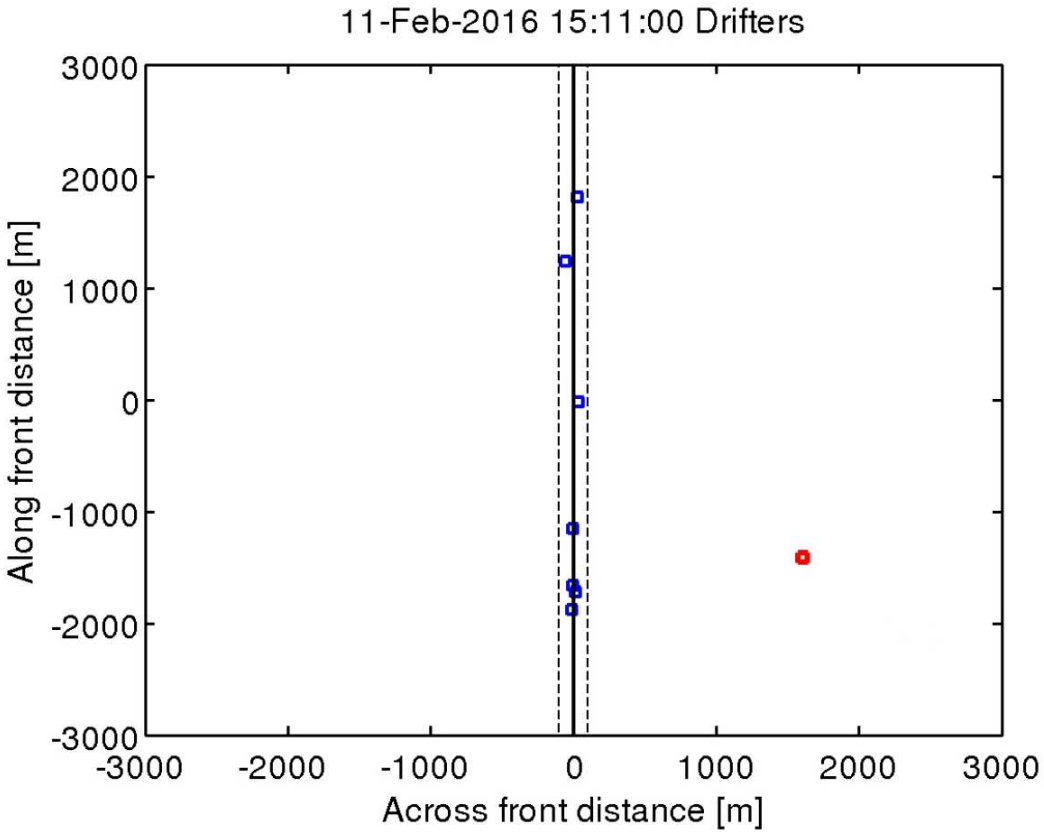

Figure 3. Movie S3 (File uploaded separately) Same as previous movie but for the trajectory of drifter C (red square) between 14:30 UTC and 20:30 UTC. Here 6 other drifters are used to define the local frame of reference. Note a 7th drifter which most likely loses its drogue around 15:30 UTC and is pulled away by the wind.

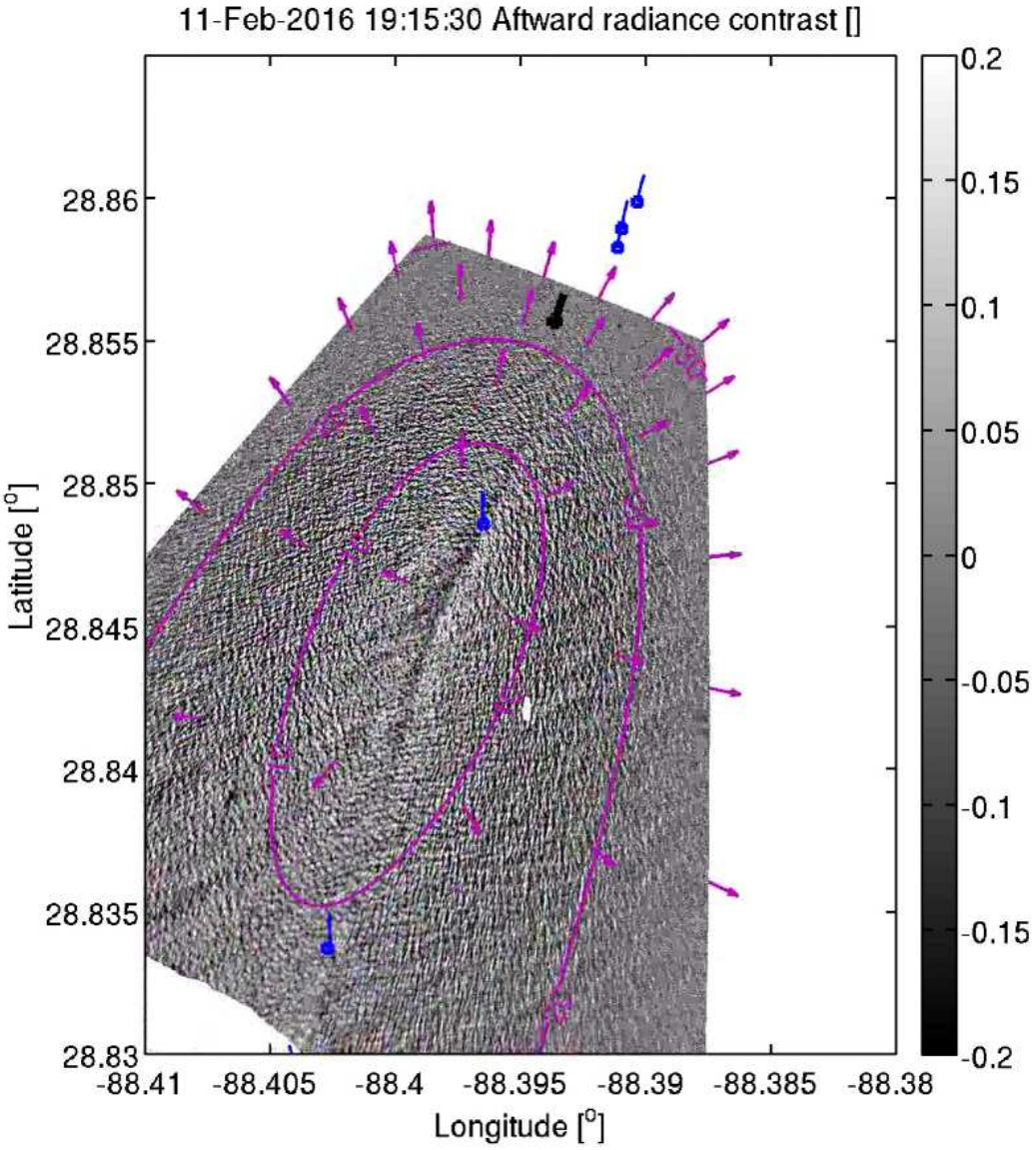

Figure 4. Movie S4 (File uploaded separately) Trajectories of 5 drifters (blue square, with a 15 min tail) on February 11 during 6 airplane passes over the front. The airplane ground position is shown in black and the instantaneous sunglint images are shown in grey scale. The pink contours (arrows) show the zenith (azimuth) angles of the surface slope making specular reflection between the sun and the airplane.