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Supporting Information for

Evolution of an atmospheric Kármán vortex street from high-resolution satellite winds: Guadalupe Island case study

Á. Horváth[1], W. Bresky[2], J. Daniels[3], J. Vogelzang[4], A. Stoffelen[4], J. L. Carr[5], D. L. Wu[6], C. Seethala[7], T. Günther[8], and S. A. Buehler[1]

[1]Meteorological Institute, Universität Hamburg, Hamburg, Germany. [2]I. M. Systems Group, Rockville, Maryland, USA. [3]NOAA/NESDIS Center for Satellite Applications and Research, College Park, Maryland, USA. [4]Royal Netherlands Meteorological Institute (KNMI), de Bilt, The Netherlands. [5]Carr Astronautics, Greenbelt, Maryland, USA. [6]NASA Goddard Space Flight Center, Greenbelt, Maryland, USA. [7]Finnish Meteorological Institute, Kuopio, Finland. [8]Department of Computer Science, ETH Zürich, Zürich, Switzerland

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Additional Supporting Information (Files uploaded separately)

Captions for Movies S1 to S5 corresponding to files horvath_etal_2019JD032121-ms01.mp4, horvath_etal_2019JD032121-ms02.mp4, horvath_etal_2019JD032121-ms03.mp4, horvath_etal_2019JD032121-ms04.mp4, and horvath_etal_2019JD032121-ms05.mp4.

Introduction

This supporting information provides the streamlines calculated from the wind vector fields plotted in Figures 5c, 6a-b-c-d, 10a, and 12a of the main article. It also provides MPEG-4 animations of GOES-16 images and the corresponding derived local wind components and vorticity. Movie S1 composed of infrared and visible band satellite images covers a longer period between 9 May 2018, 00:02 UTC and 10 May 2018, 02:42 UTC in order to give a broader context for the studied Guadalupe vortex street. Animations of derived quantities only cover the 8-hr period between 14:37 and 22:32 UTC on 9 May 2018, for which local wind retrievals are available. Movies S2, S3, S4, and S5 show the 8-hr evolution of the variables that were plotted, at four specific time steps, in Figures 6, 7, 8, and 9 of the main article. The time interval between individual images is 5 min in all animations.

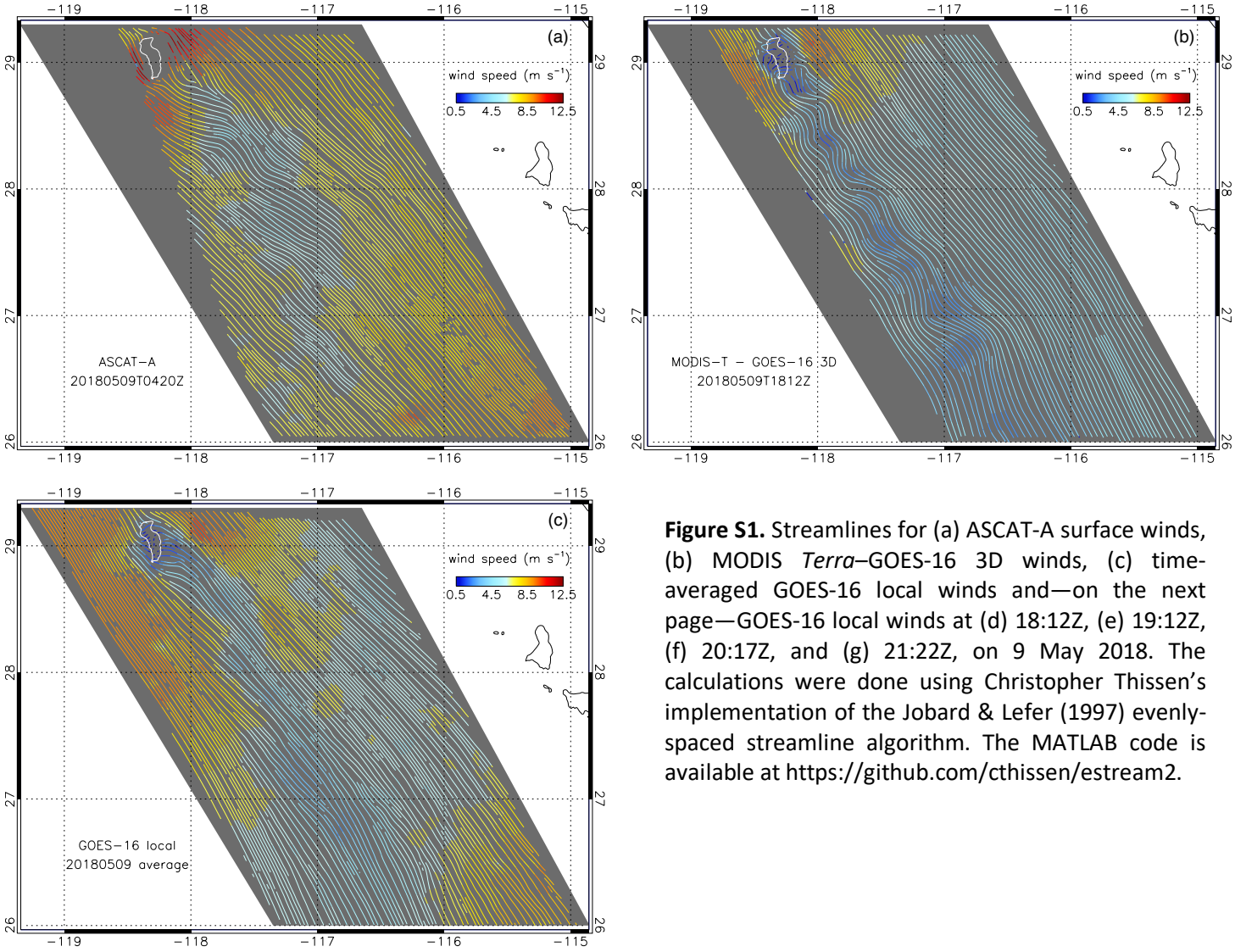
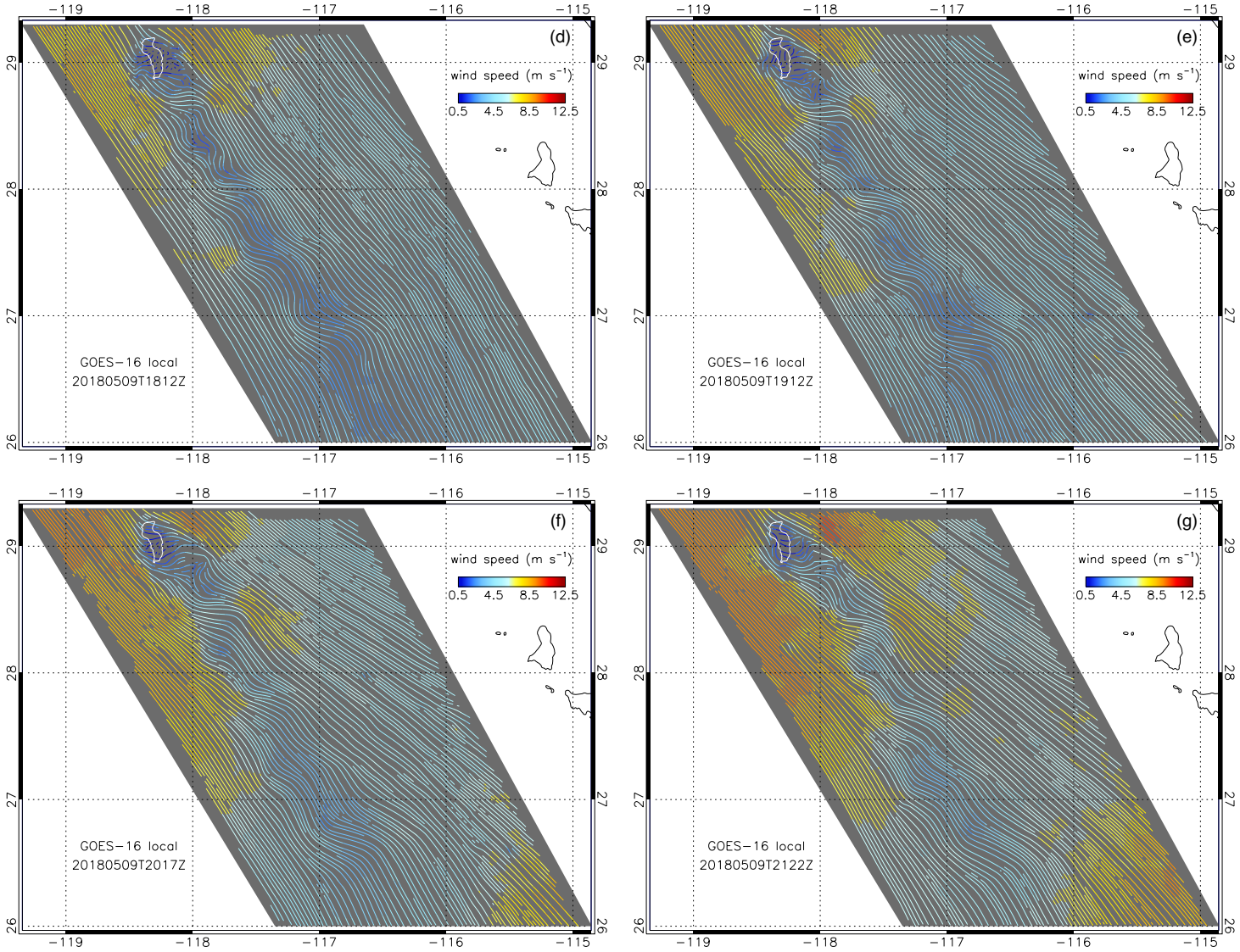


Figure S1. Streamlines for (a) ASCAT-A surface winds, (b) MODIS *Terra*–GOES-16 3D winds, (c) time-averaged GOES-16 local winds and—on the next page—GOES-16 local winds at (d) 18:12Z, (e) 19:12Z, (f) 20:17Z, and (g) 21:22Z, on 9 May 2018. The calculations were done using Christopher Thissen's implementation of the Jobard & Lefer (1997) evenly-spaced streamline algorithm. The MATLAB code is available at https://github.com/cthissen/estream2.


(d)
wind speed (m s^{-1})
0.5 4.5 8.5 12.5
GOES−16 local
20180509T1812Z
(e)
wind speed (m s^{-1})
0.5 4.5 8.5 12.5
GOES−16 local
20180509T1912Z
(f)
wind speed (m s^{-1})
0.5 4.5 8.5 12.5
GOES−16 local
20180509T2017Z
(g)
wind speed (m s^{-1})
0.5 4.5 8.5 12.5
GOES−16 local
20180509T2122Z
−119 −118 −117 −116 −115
29 28 27 26

Movie S1. Animation of GOES-16 band 7 (3.9 μm) and band 2 (0.64 μm) images of the Guadalupe study domain, mapped in cylindrical equidistant projection for the period between 9 May 2018, 00:02 UTC and 10 May 2018, 02:42 UTC at 5-minute intervals.

Movie S2. Animation of GOES-16 local wind vectors on 9 May 2018 between 14:37 and 22:32 UTC at 5-minute intervals. The wind vectors were median-filtered and resampled without smoothing on a 6.3-km UTM grid and colored according to wind speed.

Movie S3. Same as Movie S2, but for the streamwise wind component U smoothed with a 3×3-gridbox averaging window.

Movie S4. Same as Movie S2, but for the transverse wind component V smoothed with a 3×3-gridbox averaging window.

Movie S5. Same as Movie S2, but for the vorticity ζ smoothed with a 3×3-gridbox averaging window.