Supplements for Manuscript:

The MOSAiC Drift: Ice conditions from space and comparison with previous years

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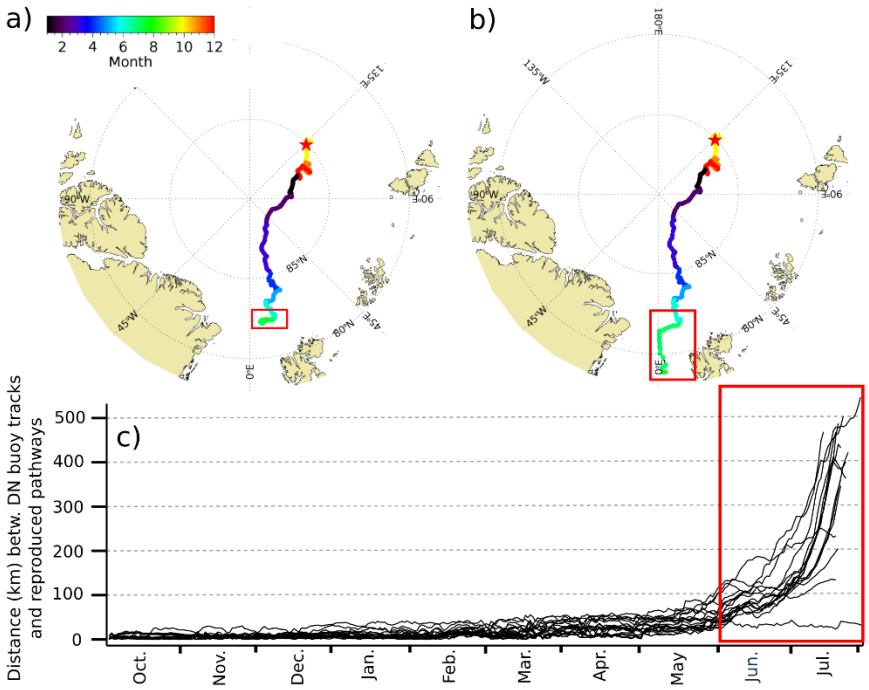

Figure S.1: Comparison of MOSAiC CO and DN buoy tracks with IceTrack results: a) Reproduced pathway of the CO with IceTrack, b) Real (GPS-based) track of the CO, c) Distance between 23 DN buoys (source: seaiceportal.de) deployed on sea ice in the vicinity of the CO at the beginning of October 2019 and their reconstructed trajectories. Deviation between real and virtual tracks is small. Only once buoys enter Fram Strait (beginning of June (240 d) at 82.5°N), the displacement is gradually increasing.

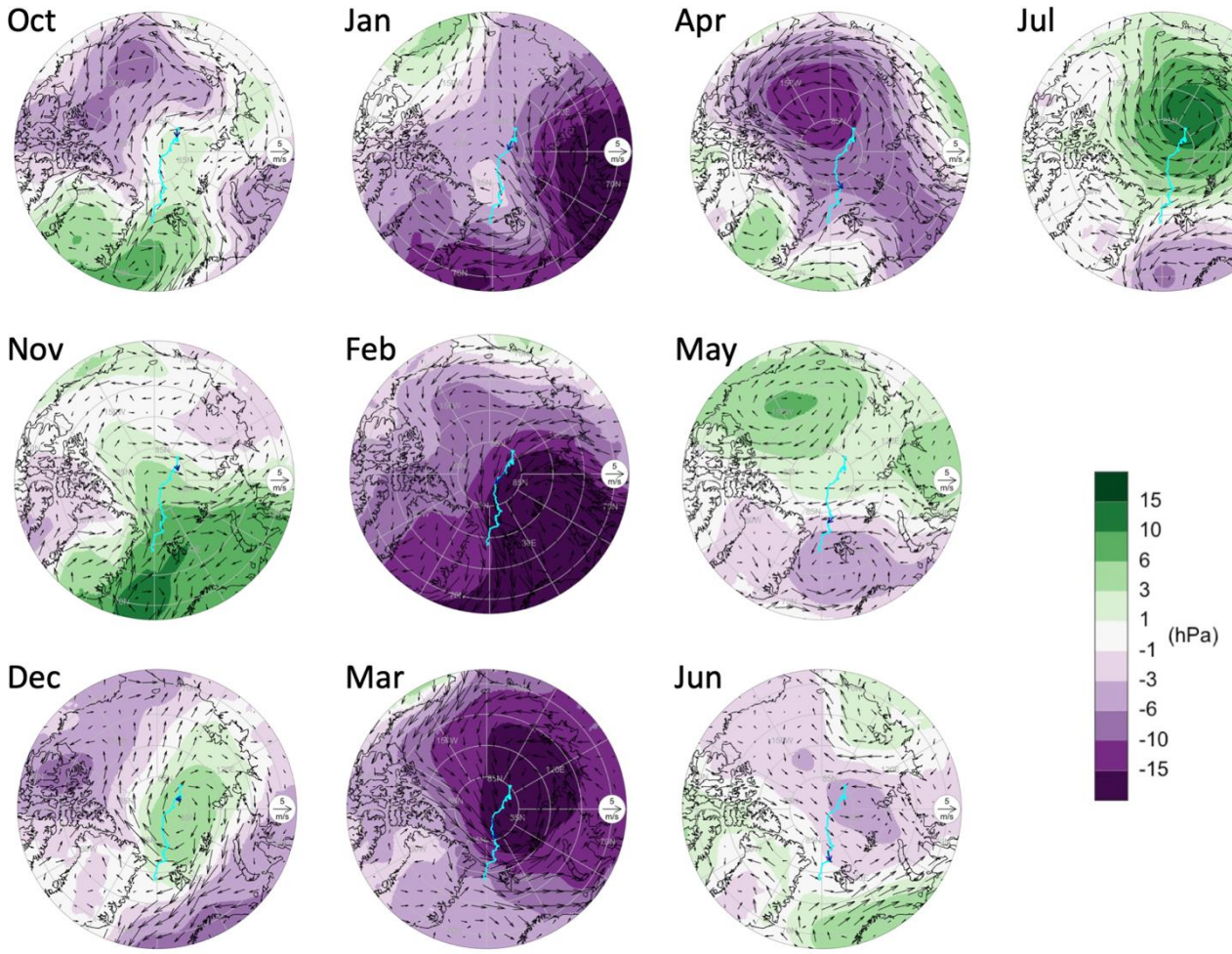

Figure S.2: Monthly-mean sea-level pressure (shading) and 10m wind (arrows) anomalies with respect to the reference period 2005-2019 for each month of the MOSAiC drift from October 2019 to July 2020. The complete drift path is denoted by cyan lines; the drift during the respective month is denoted by blue arrows.

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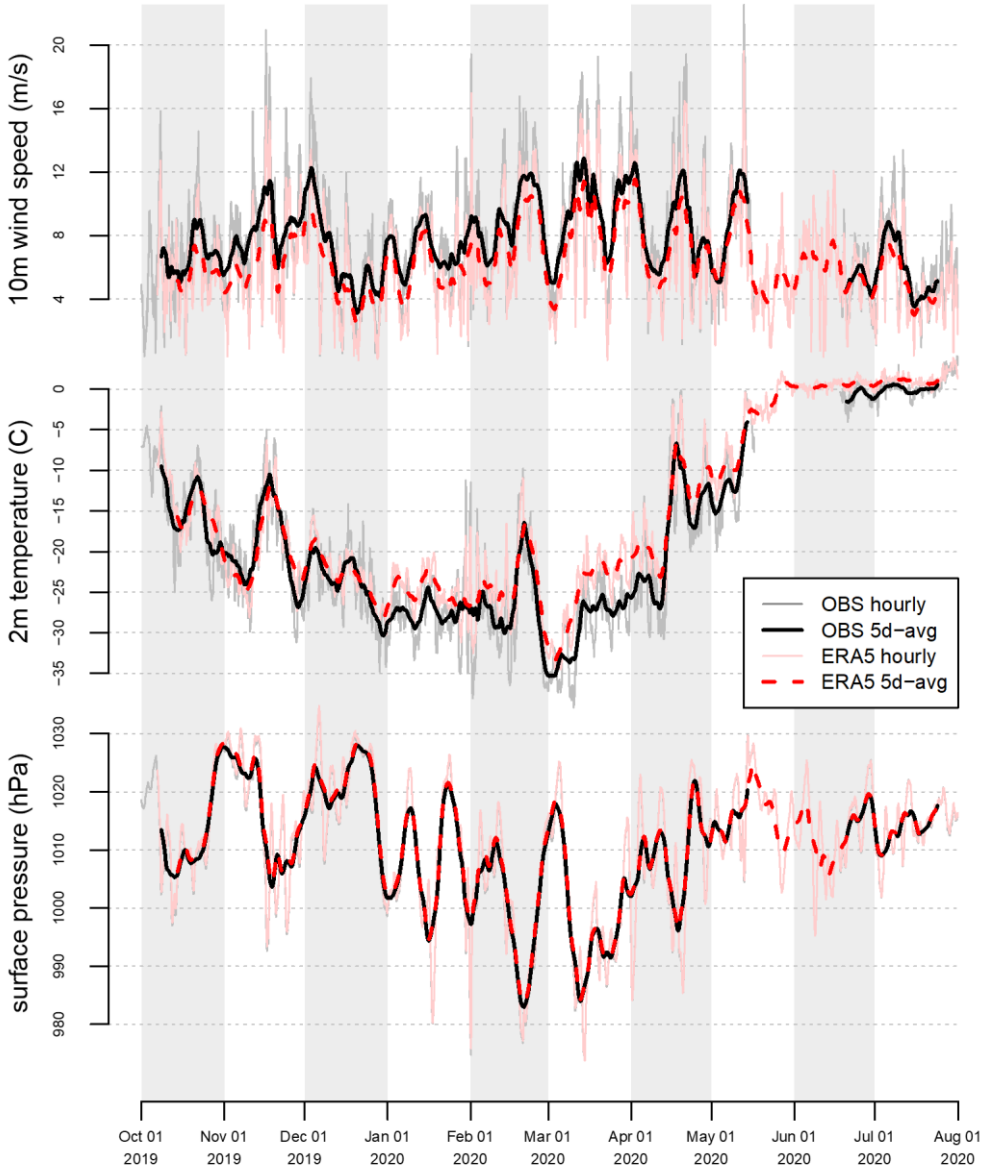

Figure S.3: Atmospheric conditions along the MOSAiC drift trajectory in 2019/20 according to ERA5 (red and light red) and according to ship measurements (black and grey). Hourly data are depicted in light red and grey; 5-days-averages are depicted in red (dashed) and black. Top: 10 m wind speed; Middle: 2 m temperature; Bottom: surface pressure.

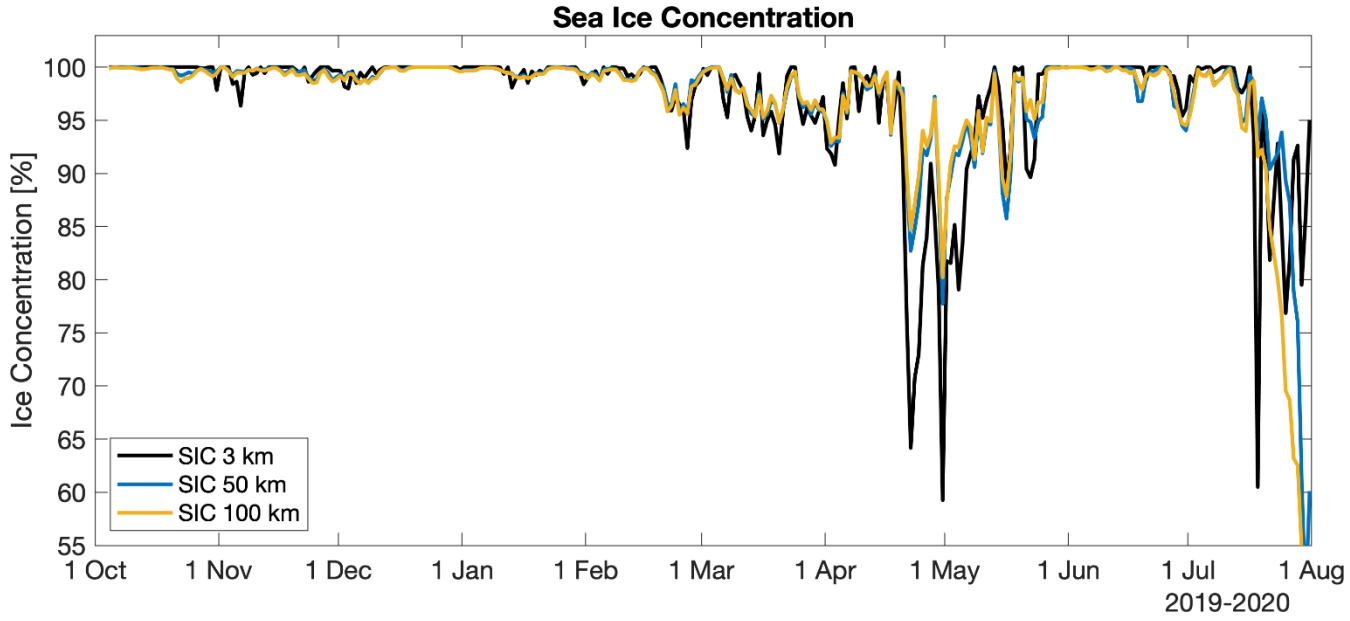

Figure S.4: Sea-ice concentration (SIC) along the MOSAiC drift trajectory from the start of the drift on 4th October 2019 until the end of the first floe on July 31 2020. Daily (no smoothing) sea-ice concentrations are shown at 3.125 (black), 50 (blue), and 100 km (yellow) radius. Please mind the significantly underestimated concentrations between mid-April to May and associated discussion in the main text and Figure 5.

Figure S.5: Distance of the MOSAiC CO to the ice edge obtained from the sea-ice concentration data set.

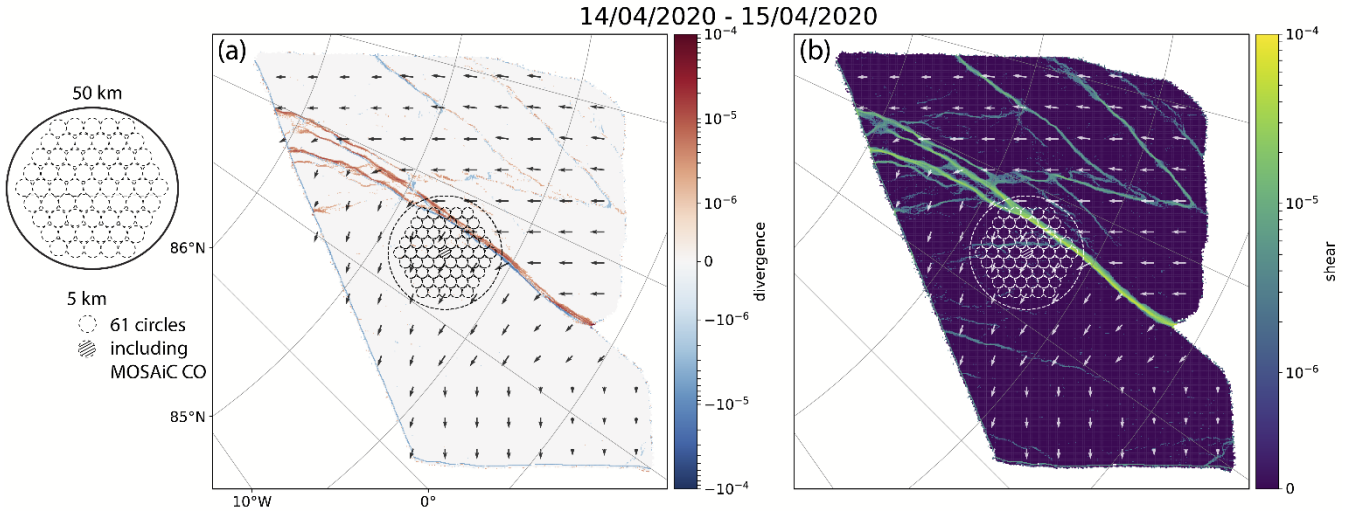

Figure S.6: Left: To compare deformation in the vicinity of the ship (5 km) with deformation at larger distances (50 km), averages were computed for 61 x 5 km circles arranged within a radius of 50 km around the ship. Centre/right: Example of divergence (middle) and shear (right) derived from two consecutive Sentinel-1 SAR images acquired on April 14 (07:26:14) and 15 (08:07:03) 2020. Sea ice motion is displayed as black arrows. The image pair shows the strongest deformation event observed: Within 24 hours, a 2.5 km wide north-south oriented lead opened up ~25 km away from the CO.