Supporting Information - Impact of North Atlantic SST and Jet Stream anomalies on European Heat Waves

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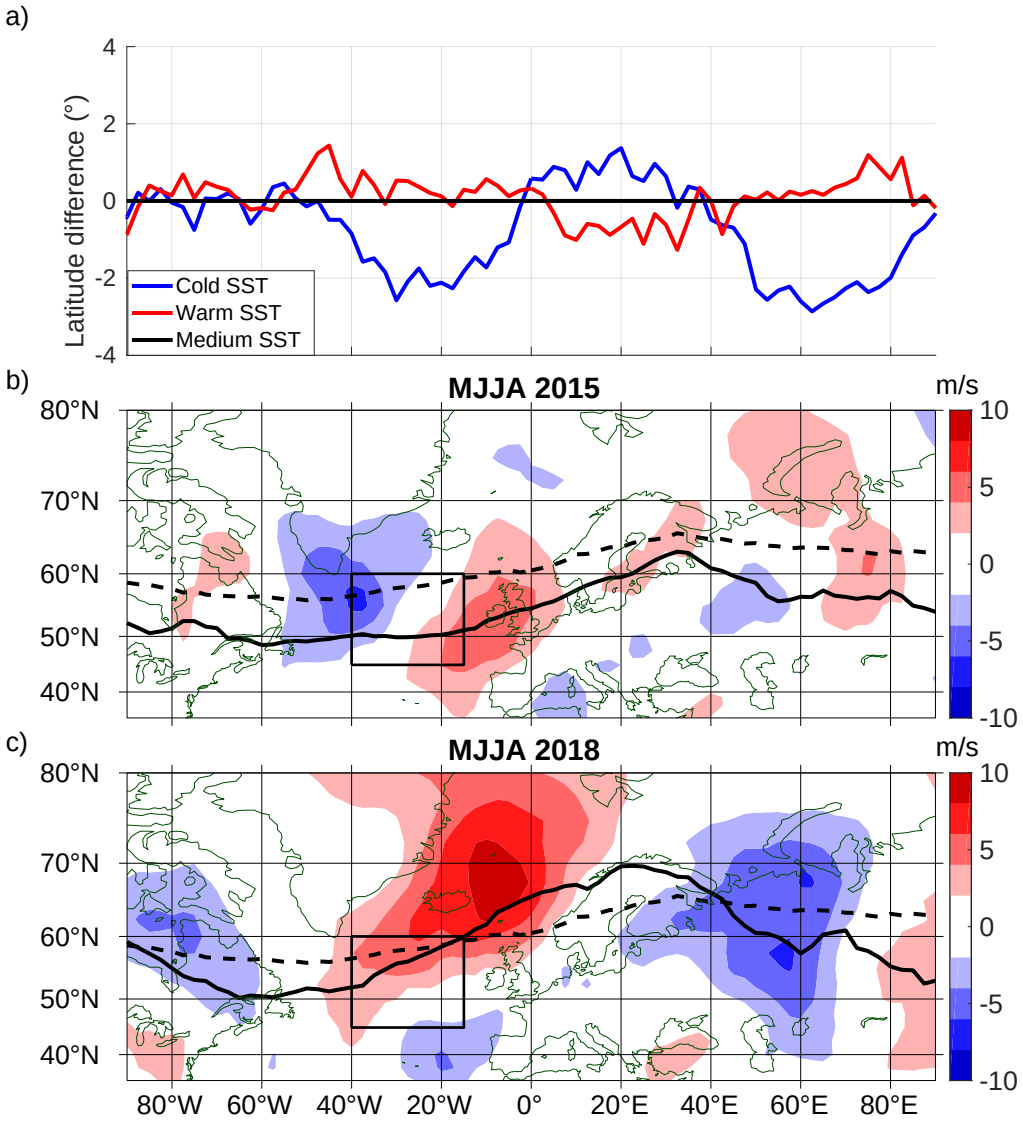

Figure S1. a) Composite of MJJA 300 hPa jet stream latitude anomalies for cold North Atlantic SST events (blue - **0.1 quantile**) and warm North Atlantic SST events (red - **0.9 quantile**) with respect to medium SST events (black); b) MJJA 2015 300 hPa total wind speed maximum for each longitude (solid) and total wind speed maximum for medium SST events (dashed); shading indicates 300 hPa meridional wind anomalies (MJJA 2015); c) same as b) but here for MJJA 2018; the maxima are detected between 45 and 90° N for each plot due to the double jet presence in this sector.

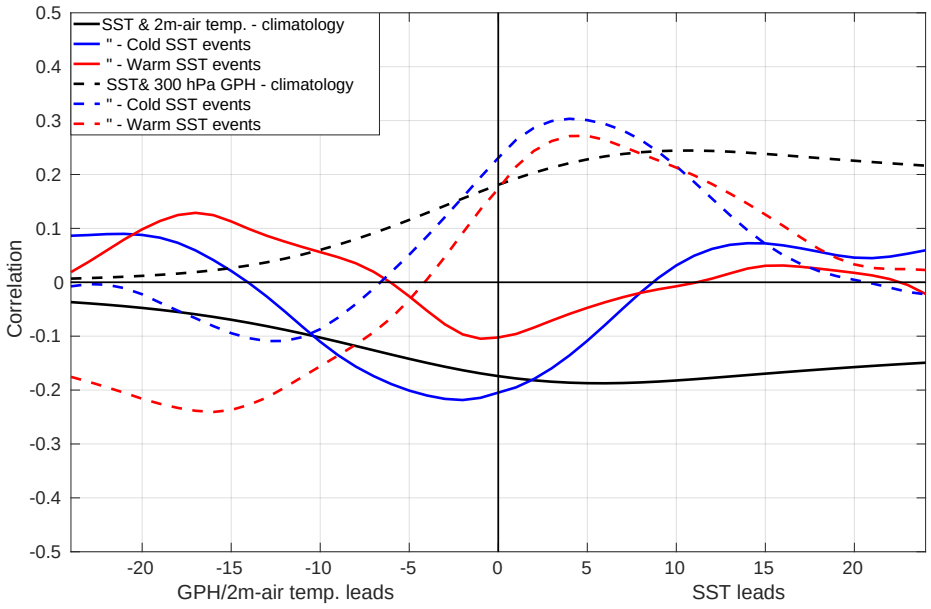

Figure S2. Correlations as a function of lag between North Atlantic SST box average (15 - 40°W and 45 - 60°N) and (i) 300 hPa geopotential height average for the same box (dashed); (ii) 2m-air temperature based on European box (5 - 22.5°E, 40 - 55°N) (solid); black lines represent the whole range (1979 - 2019), whereas blue and red lines indicate correlations with respect to cold (**0.1 quantile**) and warm (**0.9 quantile**) SST composites, respectively.

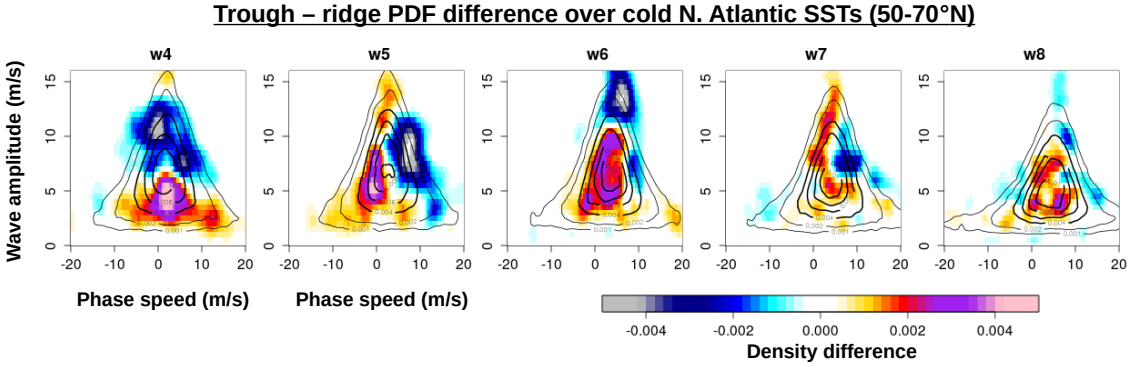

Figure S3. Probability density function of phase speed versus wave amplitude (derivation described in section 2.3; the 10% coldest SST days in the North Atlantic box (15 - 40°W and 45 - 60°N) are selected and then separated whether trough or ridge are present over this box; anomalies (coloured) illustrate the difference between trough and ridge; wave properties are shown for **50 - 70°N**; black contour lines denote the JJA climatology.

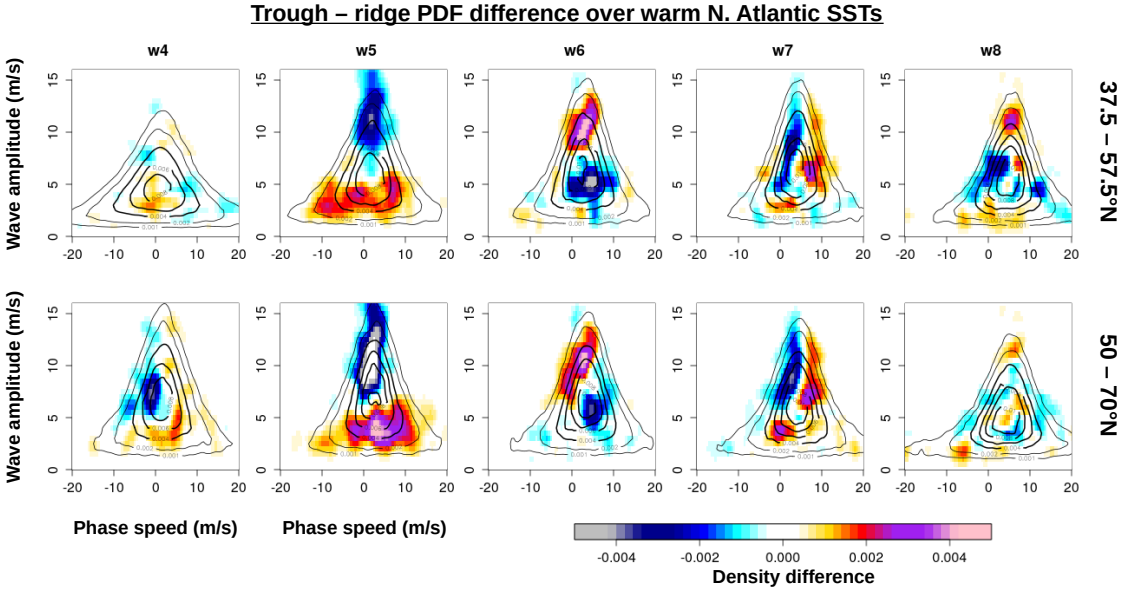

Figure S4. Probability density function of phase speed versus wave amplitude (derivation described in section sec: 2.3); the 10% **warmest** SST days in the North Atlantic box (15 - 40°W and 45 - 60°N) are selected and then separated whether trough or ridge are present over this box; anomalies (coloured) illustrate the difference between trough and ridge; wave properties are shown for **37.5 - 57.5°N (upper) and 50 - 70°N (lower)**; black contour lines denote the JJA climatology.