Supporting information for:

Multidecadal variability of the early winter ENSO teleconnection to Europe and implications for seasonal forecasting

Pablo Fernández-Castillo[1,2 *], Teresa Losada[2], Belén Rodríguez-Fonseca[2,1], Diego García-Maroto[1,2], Elsa Mohino[2], Luis Durán[2]

[1] Instituto de Geociencias (IGEO), CSIC-UCM, Madrid, Spain
[2] Departamento de Física de la Tierra y Astrofísica, Universidad Complutense de Madrid, Madrid, Spain

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* Corresponding author

Pablo Fernández-Castillo

pablof16@ucm.es

Instituto de Geociencias (IGEO), CSIC-UCM, Madrid, 28040, Spain

ORCID: 0000-0003-3441-2030

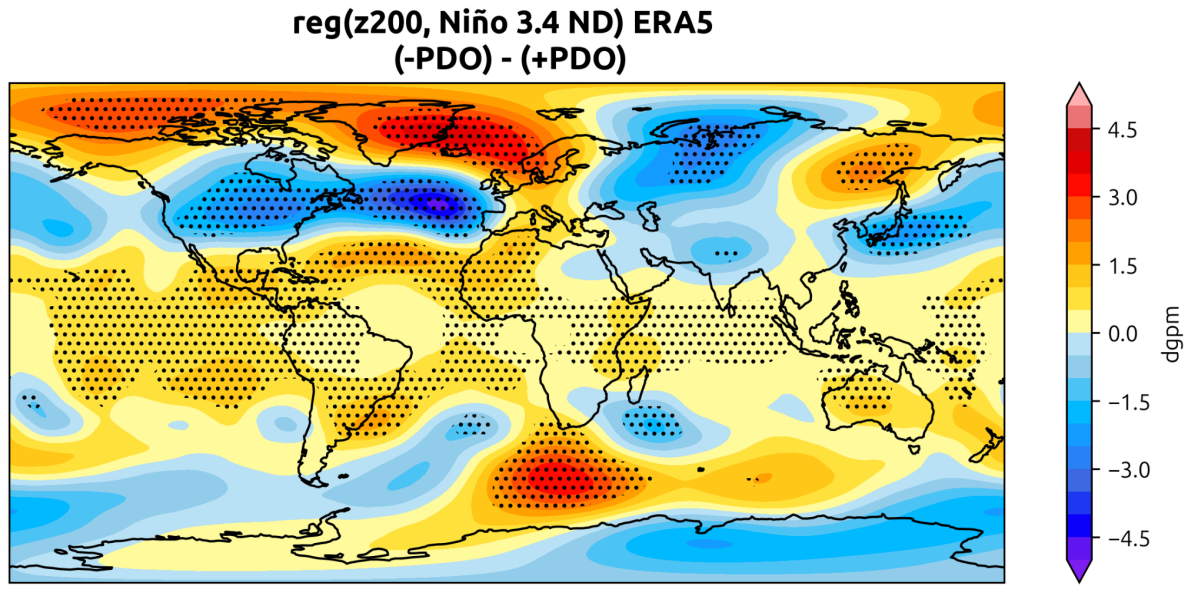

Fig. S1: Difference between the regression maps of 200 hPa geopotential height (Z200) anomalies onto the Niño 3.4 index, in +PDO and -PDO. Hatching indicates where the differences are statistically significant at the 95% confidence level, according to a bootstrap resampling.

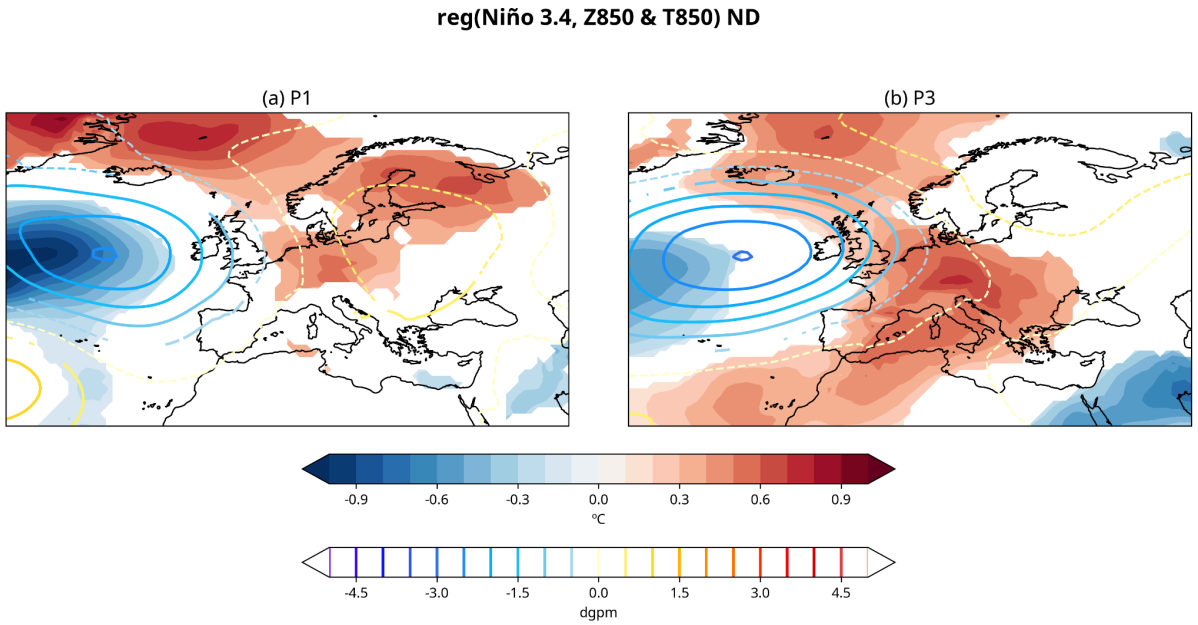

Fig. S2: Regression map of the ND Niño 3.4 index and anomalies of ND T850 (filled contours) and ND *Z850* (isolines) for the periods (a) P1 and (b) P3. For the T850 anomaly field, only values at the 90% significance level or higher are shown. For the Z850 anomaly field, values at the 90% significance level or higher are represented with solid isolines, otherwise dashed isolines are shown.

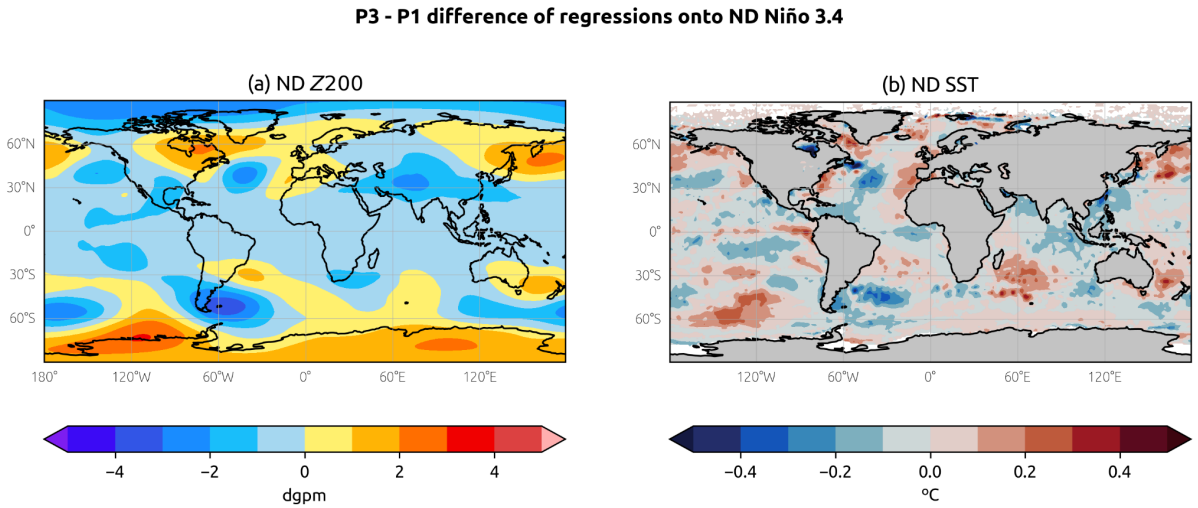

Fig. S3: Difference between the regression maps in P1 and P3 (P3 - P1) of the ND Niño 3.4 index and ND (a) *Z200* anomalies, and (b) SST.

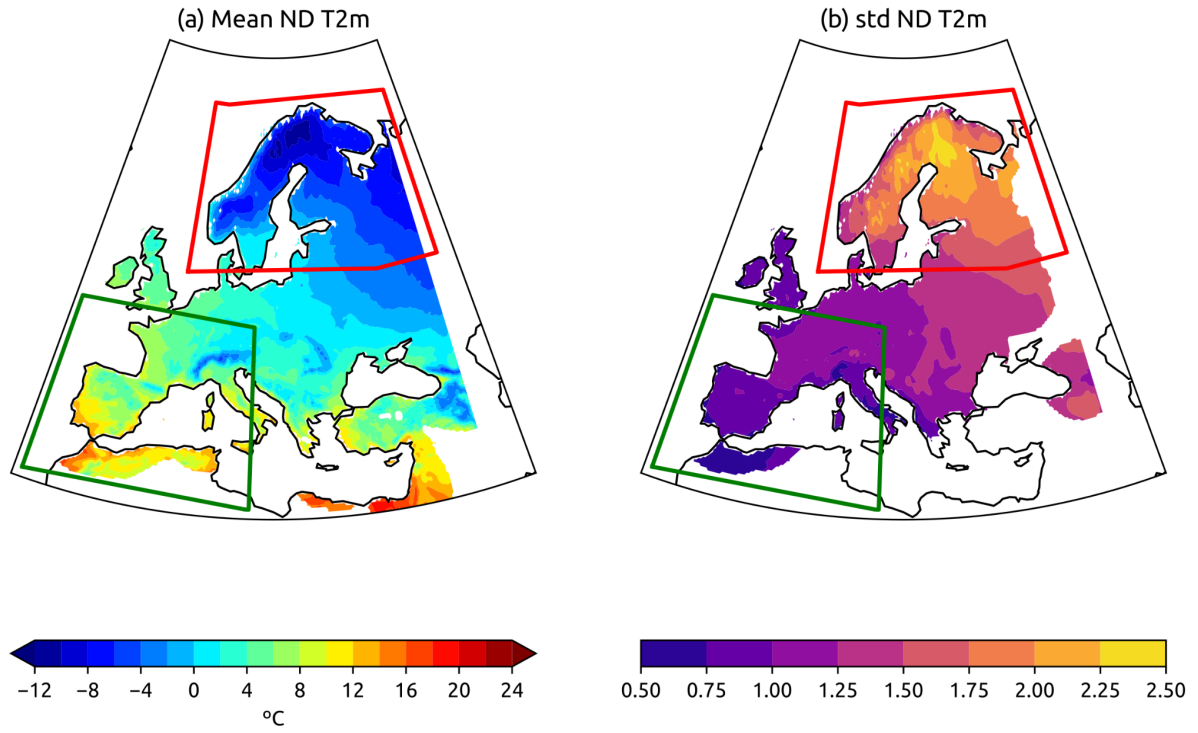

Fig. S4: ND surface air temperature (T2m) climatology in Europe, expressed in terms of the (a) climatological mean and (b) standard deviation, for the period 1950-2022. The NEEU and SWEU domains are shown with a red and green box, respectively.

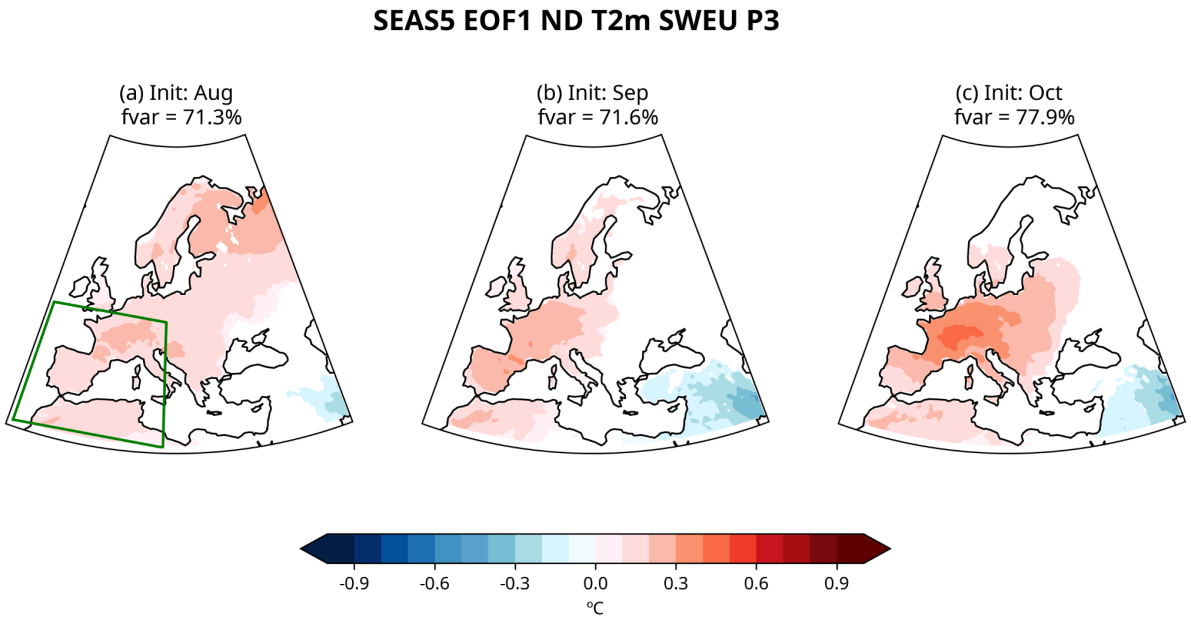

Fig. S5: Leading EOF, in the form of regression map, of the SEAS5 ensemble-mean ND T2m in SWEU in P3 for the (a) August, (b) September and (c) October initialisations. Only values at the 90% significance level or higher are shown. The SWEU domain is shown with a green box in (a).

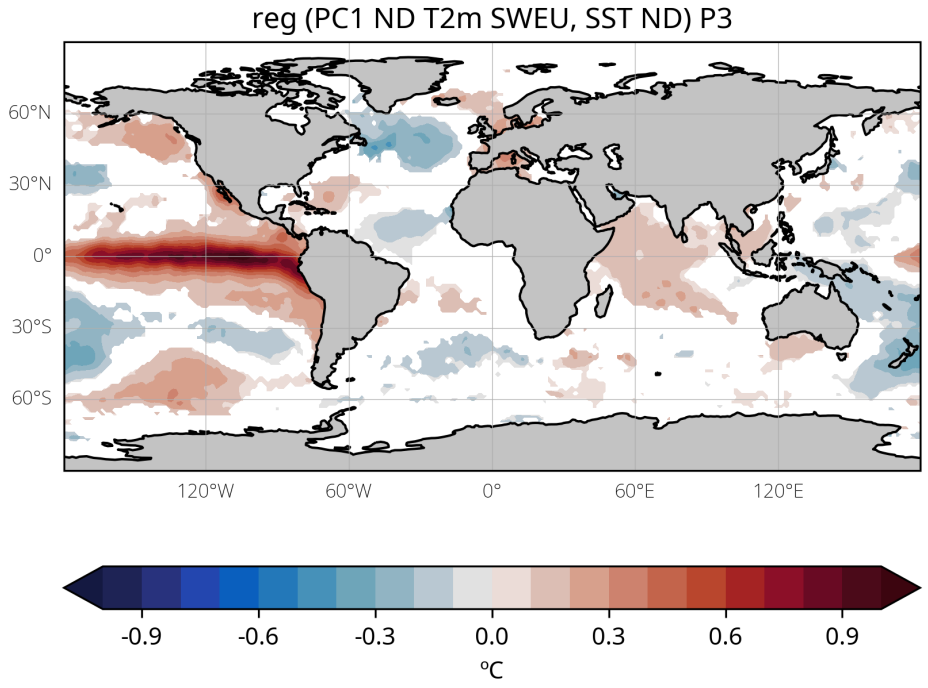

Fig. S6: Regression map of ND SST anomalies onto the leading PC of ND T2m in SWEU for the period P3. Only values at the 90% significance level or higher are shown.

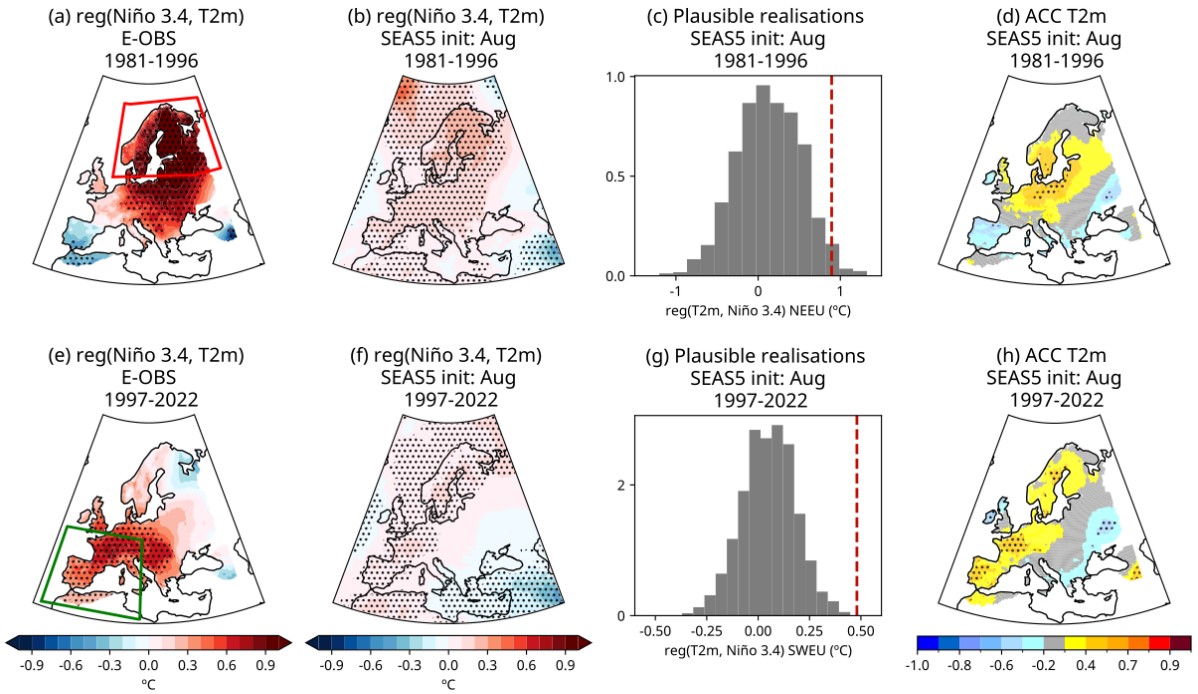

Fig. S7: Regression map of ND T2m anomaly onto ND Niño 3.4 index in the (a) E-OBS observational database and (b) SEAS5 August initialisation. Hatching in (a) and (b) represents significant values at the 90% confidence level (c) SEAS5 ACC for predicting ND T2m anomaly in the August initialisation. Hatching in (c) represents significant skill at the 95% confidence level. Results are shown for the periods 1981-1996 (top row) and P3 (1997-2022; bottom row).

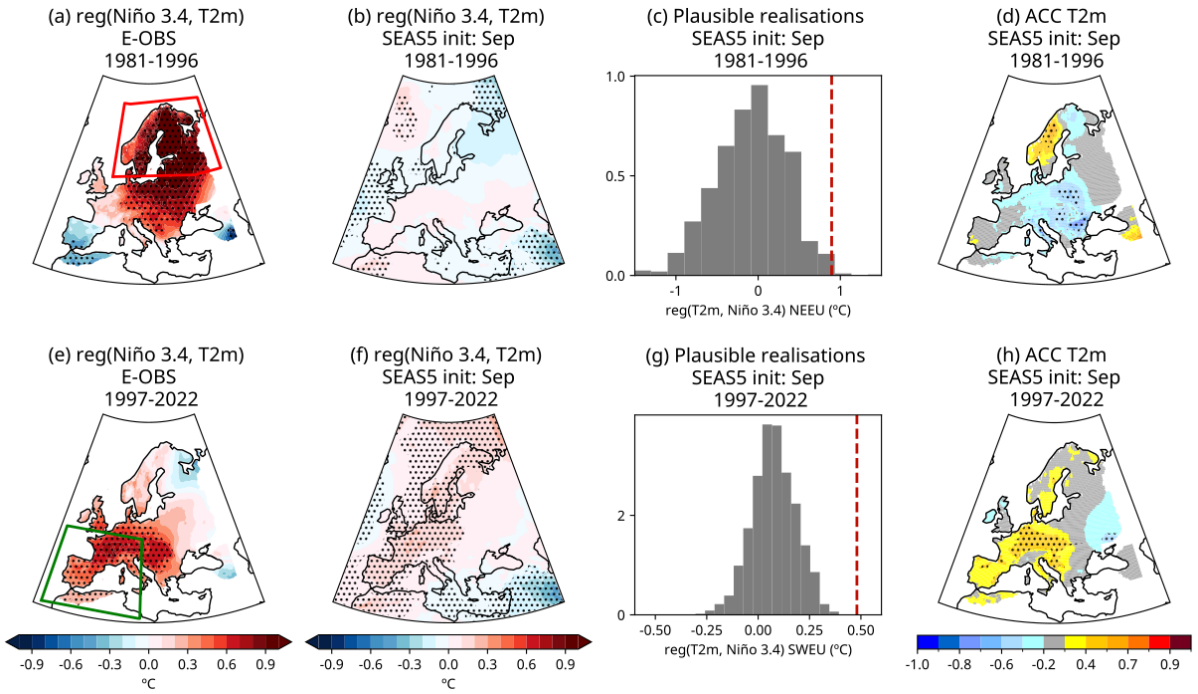

Fig. S8: As in Fig. S6, but for the September initialisation

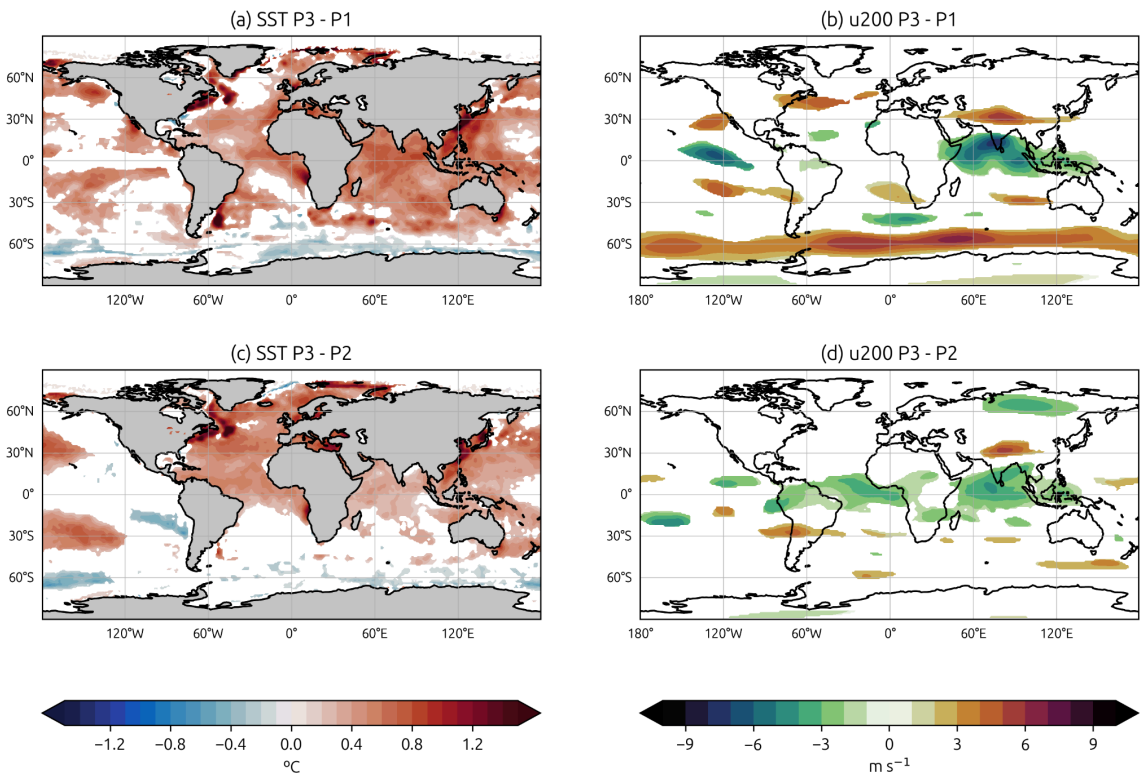

Fig. S9: Climatology difference, computed as the difference of ND means between P3 and P1 (P3 - P1) of (a) SST and (b) u200. (c) and (b): same, but for the difference between P3 and P2 (P3 - P2). Only values at the 95% significance level or higher are shown, according to a two-sided t-test.