Supplementary Material for 'Impact of stochastic physics on atmospheric blocking representation in EC-Earth3'

Michele Filippucci, Simona Bordoni, Paolo Davini
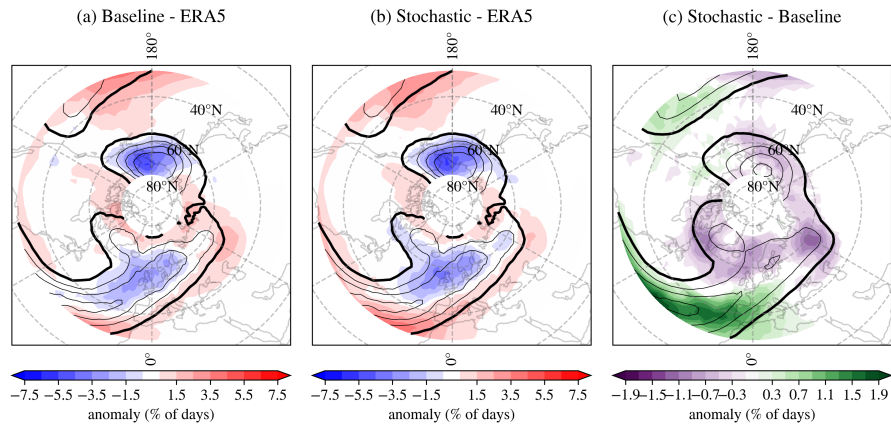
Figure S1: Climatological blocking frequency for December, January, February and March (DJFM) for TL159 (~ 125 km) model resolution. All the ensemble members have been averaged for each resolution. As in the main text, black contours refer to ERA5 blocking frequency (panel a and b) and to the baseline ensemble (c). Shading indicate the difference between (a) baseline runs and ERA5, (b) stochastic runs and ERA5 and (c) between the stochastic and baseline runs.
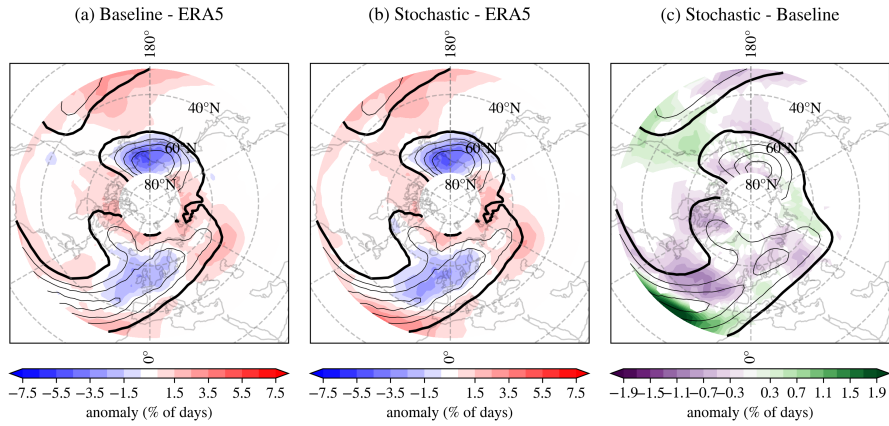
Figure S2: Climatological blocking frequency for December, January, February and March (DJFM) for TL255 (∼ 80 km) model resolution. Plot description as in Figure S1.
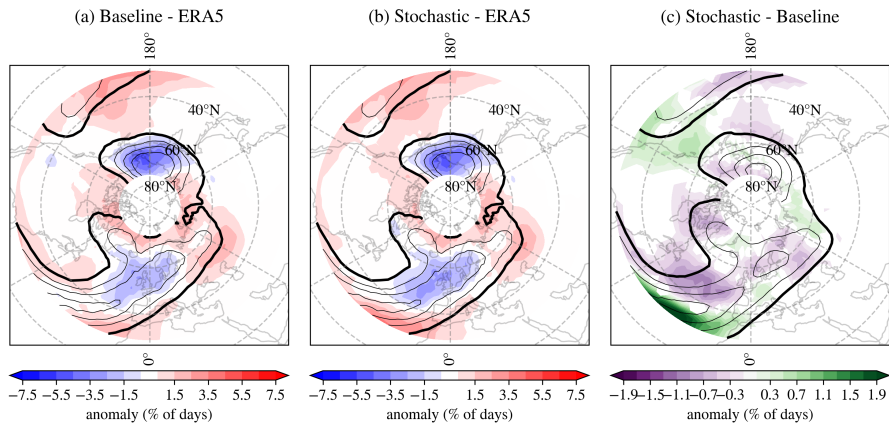
Figure S3: Climatological blocking frequency for December, January, February and March (DJFM) for TL511 (∼ 40 km) model resolution. Plot description as in Figure S1.
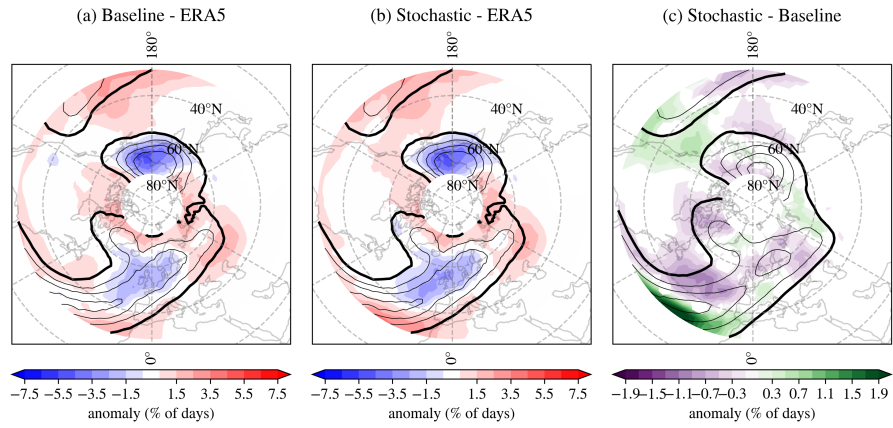
Figure S4: Climatological blocking frequency for December, January, February and March (DJFM) for TL799 (∼ 25 km) model resolution. Plot description as in Figure S1.
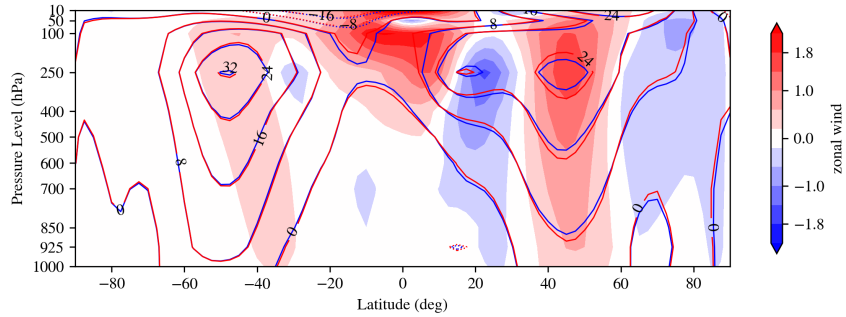
Figure S5: Zonal wind averaged over the Atlantic sector (65W,5W). Contours indicate the ensemble average, while shading represent the difference between the stochastic and baseline runs.
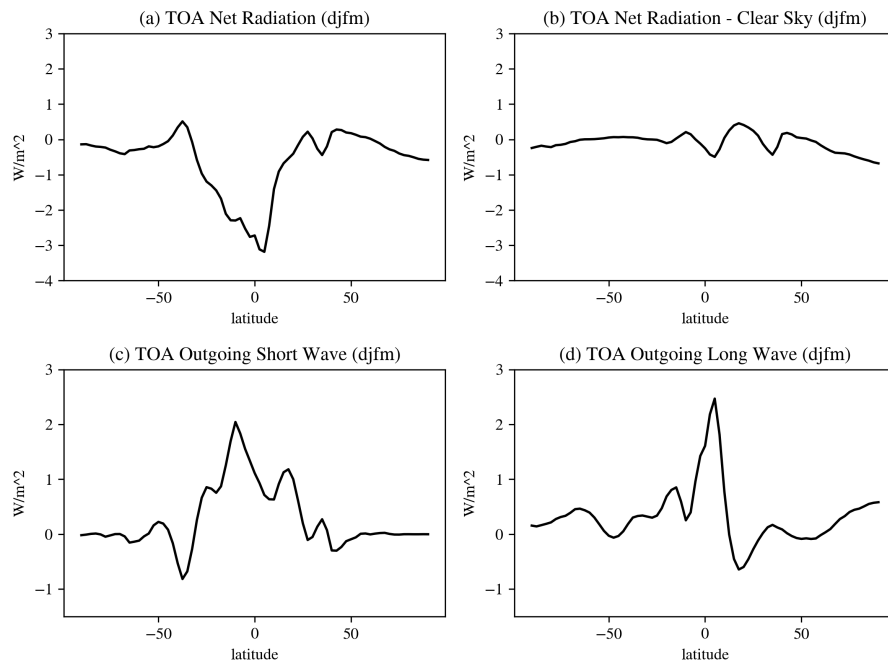
Figure S6: Differences in top-of-atmosphere radiative budget between the stochastic and baseline runs for the following quantities: a) TOA net radiative fluxes (Incoming shortwave - Outgoing shortwave - Outgoing longwave); b) Clear-sky TOA net radiative fluxes; c) TOA net shortwave radiation; d) TOA outgoing longwave radiation.

Figure S7: Climatological winter (djfm) atmospheric blocking frequency computed over ERA5 dataset 1979/2019. Every plot corresponds to a set of chosen thresholds.