Geophysical Research Abstracts
Vol. 20, EGU2018-2574, 2018
EGU General Assembly 2018

Ocean eddies in Western boundary currents modulate mid-latitude interannual variability

Reindert Haarsma (1), Javi Garcia-Serrano (2), Chloe Prodhomme (2), Omar Bellprat (2), Paulo Davini (3), Sybren Drijfhout (1,4,5)

(1) KNMI, Research, De Bilt, Netherlands (haarsma@knmi.nl), (2) Barcelona Supercomputing Center, Barcelona, Spain, (3) Consiglo Nazionale delle Ricerche, Italy, (4) IMAU, University of Utrecht, Netherlands, (5) Oceanographic department, University of Southamptom, Southampton, UK

Northern hemisphere western boundary currents are source regions for cyclogenises affecting large scale atmospheric circulation patterns. Recent high-temporal and -spatial observations and model simulations have provided evidence that ocean variability in the western boundary currents locally affect troposphere dynamics. The impact of variability of western boundary currents associated with oceanic eddies on the mean mid-latitude climate and seasonal variability is however still largely unknown. Using coupled seasonal hindcast simulations of the climate model EC-Earth at different ocean and atmosphere resolutions we provide evidence that oceanic eddies in western boundary currents significantly affect midlatitude interannual atmospheric seasonal mean variability at planetary scales, thereby modifying structure and frequency of dominant modes of variability such as the North Atlantic Oscillation. This is caused by ocean eddy induced strong ocean-atmosphere coupling on seasonal time scales. The bias, on the other hand, is hardly affected by ocean eddy induced variability, but is sensitive to the representation of small scale atmospheric processes.