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ENSO teleconnection over the Euro-Mediterranean sector: the role of extratropical Pacific modulation

Marianna Benassi¹, Giovanni Conti¹, Silvio Gualdi^{1,2}, Paolo Ruggeri¹, Javier Garcia-Serrano³, Froila Palmeiro⁴, Lauriane Battè⁵, and Constantin Ardilouze⁵

¹CMCC FOUNDATION, CSP, Lecce, Italy (marianna.benassi@cmcc.it)

²NGV, Istituto Nazionale di Geofisica e Vulcanologia, Italy

³Universitat de Barcelona, Barcelona, Spain

⁴Barcelona Supercomputing Center (BSC), Barcelona, Spain

⁵CNRM, Université de Toulouse, Météo-France, CNRS, Toulouse, France

El Niño Southern Oscillation (ENSO) represents the major driver of interannual climate variability at the global scale. Observational and model-based studies have fostered a long-standing debate on the shape and the intensity of ENSO influence over the Euro-Mediterranean sector. Indeed, the detection of this signal is strongly affected by the large variability which characterizes the atmospheric circulation in the North Atlantic and European sector.

Different mechanisms have been proposed as involved in the propagation of ENSO signal from low to mid latitude, and we want to investigate if and how the low frequency variability of North Pacific sea-surface temperature (SST) may affect their efficacy. In this work, we study how the different phases of the extratropical SST pattern linked to the Pacific Decadal Oscillation (PDO) modulates the ENSO fingerprint over the Euro-Mediterranean region.

A set of idealized sensitivity experiments designed in the framework of the MEDSCOPE project has permitted to identify the ENSO teleconnection over the Euro-Mediterranean domain and to reveal the potential modulating role of the different phases of the extratropical PDO SST forcing.

In order to place this process in a dynamical framework, a tropospheric pathway has been proposed. The propagation of planetary waves from low to mid latitude has been investigated, by looking at the sensitivity of this mechanism to different underlying mean state.

These results allow to gain a deeper understanding of the links between mid-latitude climate variability and tropical forcing and of the processes ruling the low-mid latitude teleconnection in the Northern Hemisphere. Moreover, a clearer insight of these processes may lead to a new comprehension of possible sources of predictability for the Euro-Mediterranean domain over different time scales.