

**PARALLEL SESSION A : BENEFITS OF DOWNSCALING
A2: MODELS OF THE COUPLED REGIONAL CLIMATE SYSTEM**

**Assessment of the Regional Climate Earth System Model (RegESM) simulation in
reproducing observed climatic features of the atmosphere over the CORDEX Central
America domain**

Ramón FUENTES FRANCO

ICTP - Italy

We use the recently developed Regional Earth System Model (RegESM) to assess its skill in reproducing climatic features of several atmospheric variables over the CORDEX Central American domain. The RegESM is composed by RegCM4 using CLM4.5 as land model, MITgcm ocean model and the Hydrological Discharge (HD) model, as atmospheric, land, ocean and river models respectively. By doing a comparison between atmosphere-only and RegESM simulations with observations, we show the main added value of the regional coupled model. In a ten year-period (1989-1998) simulation we analyze particularly the representation of the annual cycle over Southern Mexico and over the North American Monsoon region. The density and tracks of simulated tropical cyclones, the intensity and position of the Caribbean Low Level Jet (CLLJ), and of the Inter-tropical Convergence Zone (ITCZ) are also analyzed.

The position and intensity of the ITCZ is better reproduced by the coupled model than the atmospheric-only simulation, however over the Pacific off the coast of Mexico there is an overestimation of precipitation due to warmer SST bias. Both models are able to capture the Mid-summer drought over Southern Mexico, however the North American monsoon is better reproduced by RegESM, this due to a better reproduced moisture flux from the Pacific ocean into the Monsoon region. Higher density of tropical cyclones is also found over both (Atlantic and Pacific) oceans in the coupled model simulation, due to greater evaporation as a consequence of the ocean-atmosphere fluxes in the coupled model compared with the atmospheric only simulation.

Ramón Fuentes-Franco¹, Lina Sitz¹, Riccardo Farneti¹, Erika Coppola¹, Filippo Giorgi¹

ICTP