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Easterly waves and their changes under climate change scenarios in the Caribbean, Central America and Mexico

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In the Caribbean Sea, Central America and Mexico, the persistence of easterly waves (EW), which interact with the Caribbean low-level jet (CLLJ) modulate the regional climate. This jet is unstable barotropically and is a source of kinetic energy for the EW, under some conditions not yet fully understood, these perturbations intensify in the Caribbean Sea becoming hurricanes, with great regional impact.
This atmospheric dynamic of the Caribbean contributes to the spatial and temporal variability of precipitation in the region, knowing the mechanisms and its potential changes of the projections under climate change scenarios will improve the impact estimation in the long-term and its seasonal changes.
Additionally, EW are one of the sources of moisture for the North American Monsoon (NAM), the passage of EW from the Caribbean and Gulf of Mexico to the Pacific Ocean generates moisture advection in the southern region of the Gulf of California, where the local processes transport it to the continental area. The energy activity of EW in the Caribbean Sea impact the accumulated annual precipitation in the monsoon region.
In this study we included the EW, CLLJ and NAM variability for the historical period (1980-2009) using the RegCM model forced with the global model CSIRO (with the best performance for the region) and its projections under the RCP8.5 scenario for two future periods: 2015-2039 and 2070-2099, including the potential changes of the kinetic energy perturbation in the Caribbean and its correlation with the NAM area precipitation.
The implications of these potential changes are discussed in terms of the observed easterly waves, the CLLJ activity and its impacts in the NAM precipitation for the future periods.