Geophysical Research Abstracts
Vol. 18, EGU2016-3411, 2016
EGU General Assembly 2016

Long-term Internal Variability of the Tropical Pacific Atmosphere-Ocean System

Mohammad Hadi Bordbar (1,2), Thomas Martin (1), Wonsun Park (1), Mojib Latif (1,3)

(1) GEOMAR Helmholtz Centre for Ocean Research Kiel, D-24105 Kiel, Germany, (2) Physics Department, University of Isfahan, Isfahan 81746, Iran, (3) University of Kiel, D-24098 Kiel, Germany

The tropical Pacific has featured some remarkable trends during the recent decades such as an unprecedented strengthening of the Trade Winds, a strong cooling of sea surface temperatures (SST) in the eastern and central part, thereby slowing global warming and strengthening the zonal SST gradient, and highly asymmetric sea level trends with an accelerated rise relative to the global average in the western and a drop in the eastern part. These trends have been linked to an anomalously strong Pacific Walker Circulation, the major zonal atmospheric overturning cell in the tropical Pacific sector, but the origin of the strengthening is controversial. Here we address the question as to whether the recent decadal trends in the tropical Pacific atmosphere-ocean system are within the range of internal variability, as simulated in long unforced integrations of global climate models. We show that the recent trends are still within the range of long-term internal decadal variability. Further, such variability strengthens in response to enhanced greenhouse gas concentrations, which may further hinder detection of anthropogenic climate signals in that region.