



Transient response of El Nino to the future greenhouse warming

S.-I. An (1), J.-S. Kug (2), Y.-G. Ham (2), I.-S. Kang (2)

(1) Dept. of Atmospheric Science, Yonsei University, sian@yonsei.ac.kr (2) SEES, Seoul National University

The ENSO modulation during the future greenhouse warming has been analyzed herein by means of the numerical model simulations and the eigen analysis of the intermediate ENSO model. The response of the global-mean troposphere temperature is more likely linear to the linearly increasing CO₂, while the amplitude and period of ENSO is changing in a multi-decadal time scale. The model output suggested that the multi-decadal modulation of ENSO is mainly due to the slow response of the mean oceanic subsurface temperature compared to the response of the mean SST. Thus, the impact of mean SST change on ENSO operates without any time lag, and the impact of the mean subsurface temperature is delayed. This delayed impact may cause the multi-decadal modulation of ENSO. Furthermore, the eigen analysis of the intermediate ENSO model with considering the change of the mean SST and the mean subsurface temperature exhibits a good agreement with the climate system model simulations in terms of the multi-decadal modulations of the ENSO amplitude and period. Particularly, the change in the mean subsurface temperature turns out to be more influential than that of mean SST.