

Parameter sensitivity analysis for predicting two types of El Niño with an intermediate coupled model

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Sensitivity of El Niño simulation to model parameters is analyzed using the OPSA method, based on four El Niño events (two EP events and two CP events) simulated by an intermediate coupled model. Results show that the coefficient of entraining anomalous subsurface temperature and the ocean-atmosphere coupling coefficient are two important parameters, while the coefficient of anomalous heat flux is another important parameter for CP events. Observation system simulation experiments shows that El Niño predictions can be effectively improved if the identified sensitive parameters are more accurately estimated, whereas the improvement is very low or even negative if the estimation of only the insensitive parameters is improved, indicating the significance of the sensitivity analysis result for El Niño prediction.

Keywords: Parameter sensitivity, OPSA, Predictability, El Niño diversity, Intermediate coupled model