Horizontal distribution of Indian summer monsoon intraseasonal oscillation during ABM season

As shown in Figure 3, the horizontal distribution of ISM IO during ABM season is characterized by a pronounced band of enhanced activity centered on the equator. The amplitude of the oscillation is strongest over the central and eastern equatorial Pacific, with a secondary maximum over the western Indian Ocean. The phase of the oscillation is such that the equatorial Kelvin wave propagates eastward, leading to an enhanced convection and cloud cover in the central equatorial Pacific and a suppressed state in the central and eastern Indian Ocean.

The results from the analysis using the numerical model confirm that the horizontal distribution of the ISM IO during ABM season is consistent with previous observations and findings. The model simulations provide a deeper understanding of the physical mechanisms underlying the oscillation and its impact on the variability of the Indian summer monsoon.

The implications of these findings are significant for climate modeling and prediction. Improved representation of the ISM IO in climate models can lead to more accurate simulations of the monsoon system, which is crucial for Understanding the future evolution of the Indian summer monsoon and assessing the potential impacts of climate change.
Role of stratosphere heating on the organization of convection over the monsoon trough

Q.S. Zhang & Shuyu Chen

ABSTRACT

A recent modelling study demonstrated that stratospheric forcing of convective organisation over the monsoon trough is a key process that can drive the formation of deep convection. This study presents a simple numerical model to investigate the role of stratosphere heating on the organisation of convection over the monsoon trough. The results show that stratosphere heating can lead to the formation of deep convection, which is consistent with the findings of previous studies. The parameterization of convective organisation also includes a simple model for the vertical distribution of convective activity, which is used to simulate the vertical structure of the monsoon trough. The parameterization of convective organisation is based on a statistical analysis of convective activity over the monsoon trough in recent years.

1. Introduction

The monsoon trough (MT) is a region of strong convection over the Indian subcontinent and Southeast Asia, which is characterized by a deep, moist layer of air that extends from the surface to the tropopause. The MT is a key element of the Asian-Australian monsoon system and plays a crucial role in the regional climate and hydrological cycle. The MT is also a region of intense convective activity, which is characterized by deep clouds, heavy rainfall, and strong winds. The parameterization of convective organisation is used to simulate the vertical structure of the MT and is an important component of climate models. The parameterization of convective organisation is based on a statistical analysis of convective activity over the MT in recent years.

Effect of Stratosphere Heating on the Planetary-scale Organisation of Tropical Convection

Q.S. Zhang & Shuyu Chen

ABSTRACT

A recent modelling study demonstrated that stratospheric forcing of convective organisation over the MT is a key process that can drive the formation of deep convection. This study presents a simple numerical model to investigate the role of stratosphere heating on the organisation of convection over the MT. The results show that stratosphere heating can lead to the formation of deep convection, which is consistent with the findings of previous studies. The parameterization of convective organisation also includes a simple model for the vertical distribution of convective activity, which is used to simulate the vertical structure of the MT. The parameterization of convective organisation is based on a statistical analysis of convective activity over the MT in recent years.

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