

# 國立中央大學大氣物理研究所書報討論

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## **An analysis on the physical process of the influence of AO on ENSO**

### **Abstract**

This study mainly uses the methods of linear regression and correlation analysis to understand the physical process of the influence of Arctic Oscillation (AO) on ENSO. Especially, it conducts the energy budget and the atmospheric diabatic heating equation to explore the contribution to the thermodynamic terms and try to find the relationship between sea surface temperature (SST) anomalies and net surface heat flux. The researchers also examine the formation and time evolution of the spring AO associated westerly wind anomalies in the tropical western Pacific to realize how to sustain the westerly wind anomalies from spring to fall and induce the positive SST anomalies in the equatorial eastern Pacific in following winter.

During the positive spring AO phase, a pair of cyclonic circulation anomalies would appears and induces the westerly wind anomalies in the equatorial western Pacific. Through the net surface heat flux and the ocean heat transport, the SST would change and be accompanied by the occurrence of the atmospheric heating anomalies. This heating would sustain the wind anomalies as well. With the westerly wind anomalies maintaining and moving to the east, the downwelling Kelvin wave excited by wind anomalies also propagates to the central-eastern Pacific in summer-fall, and then it results in the El Niño-like pattern in the eastern Pacific in winter.

### **Keywords**

Arctic Oscillation (AO)

### **Reference**

Chen, S., Yu, B. & Chen, W. An analysis on the physical process of the influence of AO on ENSO. *Clim Dyn* **42**, 973–989 (2014). <https://doi.org/10.1007/s00382-012-1654-z>