

# **Statistical analysis of the interannual and decadal climate variability in the western Pacific**

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## **Abstract**

The interannual and decadal climate variability in the western Pacific is statistically analyzed using the satellite data and ECMWF reanalysis. Regional warming is detected by the long term (more than 40 years) climate variables, such as temperature, total column water vapor and wind speed trends. The composite and correlation analysis is used to analyze the anomalies of western Pacific during the damp seasons. Using the temperature and wind speed as the predictors, our multivariate analysis constructs a linear model to forecast the quantity of the local total column water vapor. Empirical Orthogonal Functions (EOF) is used to demonstrate the spatial patterns of climate change in the western Pacific. Singular Value Decomposition (SVD) further shows the covariance between the regional warming fingerprint detection variable fields. Finally, we use the traditional cluster analysis to classify the fields into several regions which can represent the local climate characteristics. Large difference in the water vapor is affected by the temperature and wind speed in the focused areas.