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The temporal variation and spatial structure of water vapor transport and budget over the Heihe Valley

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Abstract : Based on the NCEP/ NCAR re-analysis climate data, with the resolution of 2.5°×2.5° and 1°×1°, the temporal variation and spatial structure of atmospheric water vapor transport and budget over the Heihe valley are analyzed. It is found that, in annual variation of the water vapor transportation, the main effect factor is the variation of water vapor content, primary process is concentrated in June to September, and the strong transportation is in the layer of 700[U+FF5E]500hPa. In interannual variation of the water vapor transportation, there is a decreasing trend with two obvious turning points at 1960's and 1970's respectively, wind speed variation is the main factor and water vapor content variation provides a background. The strong transportation is still in the layer of 700[U+FF5E]500hPa. Spatial structure of the water vapor transportation is mainly dominated by air current distribution. The climatic characteristics are as follow, there is the convergence from south and north in the layer of surface[U+FF5E]700hPa, and the westerly wind convergence in the layer of 700[U+FF5E]500hPa, and the westerly wind divergence in the layer of 500[U+FF5E]300hPa. In the Heihe valley as a area of 2º×5º, from June to September, influent water vapor amount is about 2484×108m3, effluent water vapor amount is about 2196×108m3, and the net water vapor amount is about 288×108m3.