

# **Impact of Water Vapor over the Southeast Part of Tibetan Plateau on the Precipitation over Middle Reaches of the Yangtze River**

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## **Abstract**

Main systems including subtropical high over the West Pacific, South China Sea monsoon surge, cold air from mid-latitude and the MCSs derived from Tibetan Plateau are all active during the Meiyu period over the Yangtze River Basin which is covered by longtime torrential rain. The precipitation in Meiyu fronts influenced by eastward MCSs from the southeast part of Tibetan Plateau that is also associated with the effect of terrain is mainly caused by the upstream and downstream effect. Not only energy is transported by the eastward MCSs but also some water vapor. The characteristics and the impacts of this part of moisture with MCSs on heavy rain over Middle Reaches of the Yangtze can be discussed.

Features of the vapor transport corridors which end over Middle Reaches of the Yangtze and their moisture contributions are got through the HYSPLIT mode. 120 hours backward trajectories during the June-July of 2010 and 2012 illustrate that the water vapor below 3000m predominate and 4 major moisture corridors. They are 1) the southwest-airstream from the Bay of Bengal across Indochina, 2) the south-airstream from western Pacific across South China Sea, 3) the west-airstream derived from the southeast part of Tibetan Plateau and 4) the southeast-airstream from East China Sea. Drier northerly air currents from high latitude exist in addition. The 1<sup>st</sup> and 2<sup>nd</sup> corridors make the main moisture contributions. The 3<sup>rd</sup> one transports vapor mainly through levels between 1500m and 3000m whose moisture contributions exceed 20% during the flood season of 2010 and 2012, especially, of the trajectories ending at 3000m reach more than 30%. These trajectories with endpoints at 3000m show that the bulk of air parcels over plateau climb slowly at beginning then move upward and northeastward before the 3000m endpoints located over Middle Reaches of the Yangtze. Another part of air parcels climb eastward to 4500m then subside to 3000m approaching the Yangtze River Basin. The vertical motions in the east air currents are associated with the development of synoptic-scale systems.

**Key words:** Tibetan Plateau; Middle Reaches of the Yangtze River ;Water Vapor; Precipitation

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