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Assessing hydrologic water balance using different satellite data

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Application of hydrological models for water resources management at the scale of large continental river basins is often limited by the scarcity of in situ meteorological forcing data. Remote sensing data provide an alternative to in situ data, with observations that are, in some cases, at a higher spatial and temporal resolution than those available from traditional surface sources.
In the last few years there was an improvement in availability and quality of satellite products for all the main variables of the water cycle. So it is now possible to solve the water balance equation using only data retrieved from satellite or from some algorithms with in input satellite data (such as for evapotranspiration).
In this work, the water balance equation will be solved using only satellite data. In particular, precipitation will be retrieved from TRMM and AMSR-E, while water storage from GRACE satellite. Discharge will be retrieved from altimetry measurements from TOPEX and ENVISAT/RA data. Instead evapotranspiration will be computed using a simplified Prietsley-Taylor equation using as input satellite data of land surface temperature from AATSR or MODIS.
Satellite data will be compared with ground data to understand to what extent remote sensing observations can be used to improve estimates of the terrestrial water balance at regional to continental scales and to better represent the variability of water cycle components in space and time.
These analyses are performed for the Yangtze River basin (China) with an extent of about 1,800,000 Km2 in framework of MOST-ESA DRAGON-2 Programme.