Geophysical Research Abstracts
Vol. 19, EGU2017-1853, 2017
EGU General Assembly 2017

Regionalization of land surface heat fluxes and evapotranspiration over heterogeneous landscape: from Tibetan Plateau to Third Pole region and Pan-Third Pole region

Yaoming Ma (1,2,3)

(1) Institute of Tibetan Plateau Research, Chinese Academy of Sciences, Beijing, China (ymma@itpcas.ac.cn), (2) CAS Center for Excellence in Tibetan Plateau Earth Sciences, Chinese Academy of Sciences, China, (3) University of Chinese Academy of Sciences, China

The exchange of heat and water vapor between land surface and atmosphere over the Third Pole region (Tibetan Plateau and surrounding region) and Pan-Third Pole region (Third Pole region and surrounding region) play an important role in the Asian monsoon, westerlies and the northern hemisphere weather systems. Supported by the Chinese Academy of Sciences and some international organizations, a Third Pole Environment (TPE) Research Platform (TPEP) and Pan-TPE Research Platform (PTPEP) are now implementing over the Third Pole region and Pan-Third Pole region. The background of the establishment of the TPEP and PTPEP, the establishing and monitoring plan of long-term scale (5-10 years) of the TPEP and PTPEP will be shown firstly. Then the preliminary observational analysis results, such as the characteristics of land surface heat fluxes partitioning, the characteristics of atmospheric and soil variables, the structure of the Atmospheric Boundary Layer (ABL) and the turbulent characteristics have also been shown in this study.

The parameterization method based on satellite data and the ABL observations has been proposed and tested for deriving regional distribution of surface reflectance, surface temperature, net radiation flux, soil heat flux, sensible heat flux, latent heat flux and evapotranspiration (ET) over heterogeneous landscape. As cases study, the method was applied to the whole Tibetan Plateau area and Nepal area. To validate the proposed method, the ground-measured surface reflectance, surface temperature, net radiation flux, soil heat flux, sensible heat flux and latent heat flux in the TPEP are compared to the derived values. The results show that the derived surface variables, land surface heat fluxes and ET over the study area are in good accordance with the land surface status. These parameters show a wide range due to the strong contrast of surface features. And the estimated land surface variables and land surface heat fluxes are in good agreement with ground measurements, and all the absolute percent difference is less than 10% in the validation sites. It is therefore concluded that the proposed method is successful for the retrieval of land surface variables and land surface heat fluxes over heterogeneous landscape of the Tibetan Plateau area and Nepal area. Further improvement of the method and its applying field and regions were also discussed.