Geophysical Research Abstracts
Vol. 19, EGU2017-3291, 2017
EGU General Assembly 2017

Progress in remote sensing of global land surface heat fluxes and evaporations with a turbulent heat exchange parameterization method

Xuelong Chen (1) and Bob Su (2)

(1) Faculty of Geo-Information Science and Earth Observation, University of Twente, Enschede, Netherlands, (2) Faculty of Geo-Information Science and Earth Observation, University of Twente, Enschede, Netherlands

Remote sensing has provided us an opportunity to observe Earth land surface with a much higher resolution than any of GCM simulation. Due to scarcity of information for land surface physical parameters, up-to-date GCMs still have large uncertainties in the coupled land surface process modeling. One critical issue is a large amount of parameters used in their land surface models. Thus remote sensing of land surface spectral information can be used to provide information on these parameters or assimilated to decrease the model uncertainties. Satellite imager could observe the Earth land surface with optical, thermal and microwave bands. Some basic Earth land surface status (land surface temperature, canopy height, canopy leaf area index, soil moisture etc.) has been produced with remote sensing technique, which already help scientists understanding Earth land and atmosphere interaction more precisely. However, there are some challenges when applying remote sensing variables to calculate global land-air heat and water exchange fluxes. Firstly, a global turbulent exchange parameterization scheme needs to be developed and verified, especially for global momentum and heat roughness length calculation with remote sensing information. Secondly, a compromise needs to be innovated to overcome the spatial-temporal gaps in remote sensing variables to make the remote sensing based land surface fluxes applicable for GCM model verification or comparison. A flux network data library (more 200 flux towers) was collected to verify the designed method. Important progress in remote sensing of global land flux and evaporation will be presented and its benefits for GCM models will also be discussed. Some in-situ studies on the Tibetan Plateau and problems of land surface process simulation will also be discussed.