Geophysical Research Abstracts
Vol. 15, EGU2013-14155-1, 2013
EGU General Assembly 2013

Deriving regional estimates of energy fluxes from space from the synergy of AATSR Imagery with a land surface process model

George Petropoulos (1) and Toby Carlson (2)

(1) University of Aberystwyth, Institute of Geography and Earth Sciences, SY23 2EJ, Wales, United Kingdom, (2) Department of Meteorology, Pennsylvania State University, University Park, PA 16802, United States

Use of Earth Observation (EO) data combined with land surface process models has played an imperative role in extending our abilities to studying land surface interaction processes and enhancing our understanding on how different components of the Earth system interplay. These techniques aim at improving estimates of key parameters characterising land surface interactions by combining the horizontal coverage and spectral resolution of remote sensing data with the vertical coverage and fine temporal continuity of simulation process models. Use of such synergistic techniques is at present also operationally implemented or is investigated by Space Agencies for obtaining spatio-temporal estimates of parameters such as latent (LE) and sensible (H) heat fluxes.
In this context, the European Space Agency (ESA) Support to Science Element (STSE) funded PROgRESSIon (Prototyping the Retrievals of Energy Fluxes and Soil Moisture Content) project. One of the key project objectives is to explore the prototyping of LE and H fluxes from the synergy of SimSphere land surface process model with EO data obtained from medium resolution ESA-funded or co-funded instruments.
Here we present initial results from the evaluation of these prototype products developed exploiting satellite observations from the Advanced Along Track Scanning Radiometer (AATSR), an instrument onboard ENVISAT platform. Validation of the derived maps has been undertaken in different regions in Europe selected as representing a variety of climatic, topographic and environmental conditions, for which concurrent validated in-situ observations from operational ground observational networks were available.
The main findings are presented and discussed herein also in the context of the operational development of these parameters from space, underlying also the main challenges that still hinder accurate spatiotemporal estimation of these key land surface parameters from space.

KEYWORDS: latent heat flux, sensible heat flux, remote sensing, triangle, SimSphere, AATSR