[EE] Evening Poster | M (Multidisciplinary and Interdisciplinary) | M-IS Intersection

[M-IS05]Satellite Land Physical Processes Monitoring at Medium and High Resolution

convener:Jean-Claude Roger(University of Maryland College Park), Shinichi Sobue(Japan Aerospace Exploration Agency), Eric Vermote

Wed. May 23, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

We solicit papers on the land physical processes monitoring. In particular, it will include the inversion and use of reflectance products from Landsat(s) and Sentinel 2 sensors with other sensors. For the last years, medium and high resolutions became a useful and a powerful toll for Earth studies. Agriculture applications will be analyzed. An attention to the errors and uncertainties of the described products is suggested.

Topics of interest mainly include (not limited to):

- Use of products in agricultural monitoring applications (such as crop area, crop type, crop growing, yield estimation and prediction, damage assessment);
- Atmospheric corrections (including Cloud screening, Aerosol inversion, Radiative transfer...);
- Agriculture monitoring algorithm description;
- Data integration / Harmonized products from different sensors;
- Theoretical studies for sensors capabilities enhancements (e.g. addition of spectral bands) to future sensors for agriculture application;
- Development and use of new vegetation indices (i.e. red edge) and other products for agriculture applications;
- Evaluation or validation of potential products with ground measurements, official statistics;
- International initiative to enhance Earth-Observing-based agricultural information...

Depending on outcome, we think about a special issue.

[MIS05-P01]An Artificial Intelligence Approach for Aerosol Situation-Aware Estimation of EVI, based on Landsat8 and Sentinel-2 Time Series Big Data

*Ananjay Kumar Singh[1], Durga Toshniwal[1] (1.Indian Institute of Technology Roorkee)

Keywords:Artificial Intelligence, Situation-Aware, Big Data, Time Series, Enhanced Vegetation Index (EVI)

The efficient and reliable estimation of enhanced vegetation index (EVI) is dependent upon coefficients of the aerosol resistance terms (C1, C2), subject to utilize blue band for correcting aerosol effects in red band reflectance. The Landsat8 Surface Reflectance Higher-Level Data provided by USGS corrected from medium resolution MODIS Terra /Aqua Satellites data, contain Quality Assessment (QA) bands for confidence levels in different occlusions via aerosol, cloud etc. The Sentinel-2 also have similar reflectance bands data along with Quality Assessment (QA) bands, however, the spatial-temporal correspondence is non-synchronous with Landsat8. The state of the art approach for EVI estimations is to apply constant values of C1 and C2 parameters (e.g. C1 = 6, C2 = 7.5 in case of MODIS-EVI algorithm). The key objectives of our approach are to represent heterogeneous spatial-temporal bands and their occlusion relations as re-sampled knowledge-base and learn aerosol resistance parameters instead of using any constant terms. With frequently varying spatial-temporal nature of tropospheric aerosol, these measures are necessary to be considered for any significant vegetation index to be relied

upon. Our approach also corrects the surface reflectance band values prior to EVI calculation, in the case of occlusion by cloud and varying aerosol artifacts, defusing Spatial-temporal correlations and regressions. The Artificial Intelligence derived process pipeline consisting representation, learning and inference techniques developed on Apache Spark can easily scale for Big Data including many tiles (scenes) and over larger time-scale.