[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-P06]Multi-spectral misregistration of Sentinel-2A/MSI images

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Keywords:Sentinel-2, misregistration, multi-spectral

This study aims at analyzing sub-pixel misregistration between multi-spectral images acquired by the Multi-Spectral Instrument (MSI) aboard Sentinel-2A remote sensing satellite, and exploring its potential for moving target and cloud detection. The MSI is designed in such a way, that the sensor’s detectors for the different spectral bands are displaced from each other. This introduces a parallax angle between spectral bands that can result in along-track displacements of up to 17 km in the Sentinel-2A scene. Corresponding corrections using a numerical terrain model are performed to remove these inter-band displacements, so the MSI images, acquired in different spectral bands, are co-registered at the sub-pixel level to meet the requirement of 0.3 pixels at 99.7% confidence. However, these pre-processing routines cannot fully correct displacements for high altitude objects, e.g. clouds or fast moving objects such as airplanes or cars. Therefore, these types of objects appear displaced in images for different spectral bands. We apply a phase correlation approach to detect sub-pixel shifts between B2 (blue), B3 (green) and B4 (red) Sentinel-2A/MSI images at 10 m spatial resolution, and B08 and B8A at 20 m resolution. We show that shifts of more than 1.1 pixels can be observed for moving targets, such as airplanes and clouds, and can be used for cloud detection. We demonstrate that the

proposed approach can detect clouds that are not identified in the built-in cloud mask provided within the Sentinel-2A Level-1C (L1C) product.