Crop mapping with the Chinese and European satellite data

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Abstract: The new developments of satellite series in China and Europe are bringing new opportunities to advance the agricultural monitoring with abundant satellite data. The Sentinel and GF are both quite similar high resolution satellite series onboard European and Chinese satellites, respectively. The Proba-V and FY3-MERSI both have quite similar channels and their own advantages in the medium to low resolution satellite.

This project is going to focus on the crop mapping, crop condition monitoring and crop drought monitoring with both satellite data. The Ningxia Hui autonomous region, one of small size provinces in China, was selected as the study area for the crop mapping study with GF and Sentinel optical satellite data. The field survey was conducted in June, 2016 and 2017 as well as in June/July this year. Sen2Agri, an open source system has been developed and demonstrated in various continents and is now considered as an operational system enabling the delivery in near real time of four products for any region in the world. The GF satellite data were also collected as much as possible for the coverage of Ningxia in the growing season. The processing method of GF data is now developing in order to automatically ingest large volume data. Based on the Sen2Agri system, the 2017 cropland product is already quite promising, with an overall accuracy of 86%. The compatibility of GF data need to be evaluated and combined with Sentinel-2 data in order to improve the classification accuracy.

Another two major agricultural production areas in China, North China Plain and Northeast China Plain were also selected for the crop monitoring and crop mapping with both medium to low resolution satellite data. The field surveys were conducted in summer 2016 and spring in 2017. The relevant Proba-V satellite data have been downloaded and a processing code was developed to extract the Proba-V data for the area of interesting. The FY-MERSI process chain has been developed in the past. The classification approach was integrated with Radom Forest, Support Vector Machine and Neural Net. Hopefully the preliminary results may be reported at the symposium.

Keywords: Crop Mapping; Classification; GF; Sentinel, Sen2Agri