Preliminary Analysis on Rising 2 images' spectral information and its potential for disaster monitoring and prediction

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Importance of disaster monitoring, prediction and mitigation has increased in the past years mainly due to climate change. Based from the Inter-governmental Panel on Climate Change-Fifth Assessment Report (IPCC-AR 5), regions in West, East and South-East Asia will experience an increased in mean annual temperature and precipitation will likely be more extreme in mid- and late- 21st century. The increase on the occurrence of severe typhoons and droughts will be observed in the said regions. In-order to cope up and adapt with the problems brought by Climate change, remote sensing with the use of micro-satellite as a platform has become an indispensable tool. Satellite remote sensing can cover a very large area and produce detailed image of the land and can repeatedly observe the area in a short period of time.
One of the most recent earth-observation microsatellite is Rising-2, which was launched last May 24, 2014. It is equipped with 5 scientific payloads: High Precision Telescope (HPT) with 5m spatial resolution at nadir and has four (4) CCD detector, for Red, Green and Blue region and the fourth CCD has Liquid Crystal Tunable Filter (LCTF) for 650 to 1000 nm spectral range; Bolometer (BOL) with 1km spatial resolution and spectral range of 8 to 14 μm; Lightning Spectrum Imager-1 (LSI-1) and Lightning Spectrum Imager-2 (LSI-2) with a field of view of 342 km and a spectral range of 744 to 826 nm and 762 nm respectively; Wide Field Camera (WFC) with a field of view of 140 degrees.
In this study, six (6) images captured in Japan observed at 665 nm, 683 nm, 700 nm, 720 nm, 750 nm and 873 nm wavelengths using Rising-2's High Precision Telescope were acquired and analysed. Image matching and geo-referencing were done to get the overlap and spatial resolution of the 6 images. Spectral information then is acquired by using calibration parameters for the HPT. From the spectral information, land cover and condition of the vegetation were then classified by using different indices like NDVI and NDWI. Preliminary results show that spectral analysis has a very huge potential for disaster monitoring, prediction and mitigation.

Keywords: Remote Sensing, Microsatellite, Disaster monitoring

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