**Analysis of Remote-Sensing Data from Airborne Multicolor Imager using UAV**

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**Abstract:** The tropical peatland is a significant carbon reservoir, but recently it has become a crucial CO2 emission source due to the wild fire and rapid development works. Hokkaido University Group has conducted long-term research at Central Kalimantan’s peatland in close cooperation with Indonesian experts by JSPS Core University Program (1997-2008). Following that, “Wild Fire and Carbon Management in Peat-Forest in Indonesia” project has been conducted supported by JST-JICA since 2010 until 2014, collaborated with Indonesian counterparts as LAPAN, LIPI, Ministry of Forestry, University of Palangka Raya/UNPAR and RISTEK. Furthermore, the collaboration between the Agency for the Assessment and Application of Technology (hereinafter referred to as “BPPT”) and Hokkaido University, Japan have been established and signed on August 5th, 2012.

In the meantime, advanced sensors are developed in Hokkaido University. One of the examples is AMI (Airborne Multicolor Imager) using the LCTF (Liquid Crystal Tunable Filter) technology, which can select any colors with ~20 nm bandwidth in 420-700 nm at 1 nm step. This multispectral sensor is suitable for measuring parameters essential for tropical peatland carbon management. Other sensors using the LCTF technology are installed on the RISING-2 and RISESAT microsatellites and will be launched in 2013-2014. Therefore, AMI is positioned as a precursor to the future satellite remote sensing of the tropical peatland.

To demonstrate the performance of AMI, the airborne campaign was conducted on 29th-31th October 2012, in West Java, Indonesia, using un-manned aerial vehicle (UAV) of BPPT called PUNA. AMI was installed on PUNA “Wulung”, which has capability to fly using autopilot to reach area in radius of 70 km and altitude of 8000 feet (2.4 km). In this campaign, Wulung flied over the target location in the peat swamp forest area, about 50 km east of Nusawiru airport. During the flight, AMI captured a total of 16625 digital images of 420-700 nm at a 10-nm step with 2 images/sec. Parameters for classification of tree species in the peatland forest and other land-uses were measured in the area. AMI was proven to be suitable for Measurement, Reporting and Verification (MRV) using UAV, which is a cost-effective tool for remote-sensing.

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Keywords: Multispectral sensor, LCTF, Peatland forest, UAV, Microsatellite