

Remote sensing of CO₂ to evaluate the CO₂ emission from forest/peat-land fires

Masahiro Kawasaki^{1*}, Gen Inoue², Masafumi Ohashi³

¹RIHN, ²University of Tokyo, ³Kagoshima Univeristy

The evaluation of CO₂ emission especially from peat-land is one of key issues of MRV (Measurement, Reporting and Verification). The surface temperature of peat-land fire is relatively low and it is frequently discounted in fire hot-spot data. The amount of carbon loss or CO₂ emission is difficult to estimate from the carbon stock change because it is accompanied by inhomogeneous and small subsidence. The loss in peat-lands occurs underground in some cases. So, the loss estimation from the flux observation superiors to the stock-change measurement.

The flux observation over forest is usually conducted by flux tower measurement (Eddy covariance method) for carbon budget of ecosystem which includes tree and soil processes. However, this measurement is limited to the homogeneous process, which is not the case for tropical peatland fire.

The CO₂ flux from fire can be measured by observing the CO₂ concentration and wind speed surrounding the area of interest. The remote sensing of CO₂ column amount (integrated CO₂ amount from surface to the space) can be done either from space on a satellite (GOSAT) or on the ground observing the direct solar spectrum. The authors have developed a fully automated optical fiber system to observe CO₂ emission continuously. Two instruments were installed at Banjar Baru and Palangka Raya in August-October, 2011. The CO₂ concentration difference between south/north sites and its diurnal variability will be discussed.

Observation of carbon-mono-oxide CO is expected to be a useful tool to identify between above and below-ground fires. Preliminary observation has been tried at Palangka Raya as well.

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