

Development of a three dimensional information extraction method from an airborne sensor (ARTS-SE) multiple-view images

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To increase the opportunity for the airborne observations, we have developed our 2.5nd-generation airborne imaging system, the Airborne Radiative Transfer Spectral Scanner for a single-engine aircraft (ARTS-SE) for volcano observations in June of 2015. The platform for ARTS-SE is a widely used single-engine Cessna 208 aircraft. ARTS-SE consists of a modified system of our former push-broom imaging spectrometer (ARTS) and a newly developed camera system; Structure and Thermal Information Capture (STIC). This system consists of four cameras. These cameras are the two visible cameras and the two thermal infrared cameras. The STIC specifications were planned to provide images data set for Structure from Motion (SfM) technique for operational volcanic observations to assess volcanic activity. We present first results of data analyses for visible and infrared image from STIC image (Hakoneyama (Owakudani) acquired on 5 December 2015) using commercial photogrammetric image processing software packages. We demonstrate how STIC images can be used to detect a three dimensional information of volcanic geothermal field.

Keywords: airborne sensor, SfM, volcano, infrared remote sensing