地球環境観測のためのASTER熱赤外放射計に対する代替校正活動
Vicarious calibration activities of ASTER Thermal Infrared Radiometer (TIR) for Earth environmental observation

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The Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) instrument on the Terra satellite has been retrieving multiband images with 14 spectral bands from the visible through thermal infrared and stereo images over the Earth's surface since 2000. The data set by ASTER has provided the composition and distribution of materials, temperature/emissivity map, and digital elevation topography models (DEM), contributing to a variety of Earth's science applications, i.e., natural resources, agricultural applications, natural disasters, geology, and urban development as well as monitoring global environmental change. In addition, the data of ASTER is being used for space business involved in space-enabled economic activity and service.

In order to establish the ASTER data for high-accuracy applications, radiometric calibration and atmospheric correction are highly important. Since any optical sensor is expected to degrade in space, we need to monitor the performance of the sensor over time based on onboard and vicarious calibrations. One of vicarious calibration approaches characterizes instrument performance based on comparison with the data measured by field campaigns at homogeneous ground areas such as lake and desert sites. The field campaigns for ASTER took place at various test sites such as Railroad Valley Playa, Lunar Lake, and Alkali Lake in Nevada and water sites such as Lake Kasumigaura in Japan during about two decades.

On 30 August through 1 September 2018, as part of annual vicarious calibrations for ASTER Thermal Infrared Radiometer (TIR), we conducted the field campaigns at Railroad Valley playa and Alkali Lake in Nevada. We also made the vicarious calibration at Lone Mountain playa in Nevada, which is a new test site discovered during this campaign. In this presentation, we will report the activity of the 2018's field campaigns at Nevada, and discuss how important the radiometric calibration after launch is to Earth's science applications including assessment of global environmental change based on satellites.

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