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ONLINE ISSN : 1883-1184

PRINT ISSN : 0289-7911

Journal of The Remote Sensing Society of Japan

Vol. 27 (2007) , No. 4 p.329-343

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Initial Calibration Results and Accuracy Assessments of PRISM and AVNIR-2 Onboard ALOS

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(Received May 1, 2007)

(Accepted July 9, 2007)

Abstract

The Advanced Land Observing Satellite (ALOS, nicknamed “Daichi”) was successfully launched on January 24, 2006. This paper introduces the calibration and validation plan and their initial results of two optical sensors, the Panchromatic Remote-sensing Instrument for Stereo Mapping (PRISM) and the Advanced Visible and Near Infrared Radiometer type-2 (AVNIR-2) onboard ALOS, and accuracy assessments during one year after launch. PRISM consists of three independent panchromatic radiometers and is capable to derive a digital surface model (DSM) with high spatial resolution, which is an objective of the ALOS mission. Thus, geometric calibration is important in generating a highly accurate DSM with stereo pair images of PRISM. The geometric calibrations of both PRISM and AVNIR-2 were done by evaluating relative accuracies within one scene as relative calibration, and sensor alignments as absolute calibration. AVNIR-2 has four radiometric bands from blue to near infrared to be used for regional environment monitoring such as land-use and land-cover classification, disaster monitoring, *etc.* Relative radiometric calibrations of both PRISM and AVNIR-2 was carried out using acquired images over homogeneous targets such as ocean, deserts, ice and snow areas, and nighttime observation. For absolute radiometric calibration of AVNIR-2, cross-calibration methods using calibrated satellite images *e.g.* the Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) onboard TERRA satellite was applied. The image quality is also important for many application fields. The absolute radiometric calibration of PRISM was carried out as cross-calibration with AVNIR-2. In this paper, we introduce the calibration and validation plans, results of initial calibration, and accuracy assessments of the standard products of PRISM and AVNIR-2.

Keywords: ALOS, PRISM, AVNIR-2, calibration, geometry, radiometry

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To cite this article:

Takeo TADONO, Masanobu SHIMADA and Hiroshi MURAKAMI: Initial Calibration Results and Accuracy Assessments of PRISM and AVNIR-2 Onboard ALOS , Journal of The Remote Sensing Society of Japan, **27, 4**, pp.329-343, 2007 .

JOI JST.JSTAGE/rssj/27.329

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