

# **Radiometric Calibration Assessment of Commercial High Spatial Resolution Multispectral Image Products**

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Radiometric calibration of commercial imaging satellite products is required to ensure that science and application communities can better understand commercial imaging satellite properties. Inaccurate radiometric calibrations can lead to erroneous decisions and invalid conclusions and can limit intercomparisons with other systems. In addition, the user community has little or no insight into the design and operation of commercial sensors or into the methods involved in generating commercial products. To address this calibration need, the NASA Stennis Space Center (SSC) Applied Sciences Directorate (ASD) established a commercial satellite imaging radiometric calibration team consisting of three independent groups: NASA ASD, the University of Arizona Remote Sensing Group, and South Dakota State University.

Each group independently determined the absolute radiometric calibration coefficients of available high-spatial-resolution commercial 4-band multispectral products, in the visible through near-infrared spectrum, from GeoEye™ (formerly Space Imaging®) IKONOS, DigitalGlobe® QuickBird, and GeoEye (formerly ORBIMAGE®) OrbView. Each team member employed some variant of a reflectance-based vicarious calibration approach, requiring ground-based measurements coincident with image acquisitions and radiative transfer calculations. Several study sites throughout the United States that covered a significant portion of the dynamic range of the sensors were employed. Satellite at-sensor radiance values were compared to those estimated by each independent team member to evaluate the sensor's radiometric accuracy. The combined results of this evaluation provide the user community with an independent assessment of these commercially available high-spatial-resolution sensors' absolute calibration values.

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For submittal to JACIE Civil Commercial Imagery Evaluation Workshop, March 14–16, U.S. Fish and Wildlife Service National Wildlife Visitors Center, Laurel, Maryland

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*Participation in this work by Science Systems and Applications, Inc., was supported by NASA under Task Order NNS04AB54T at the John C. Stennis Space Center, Mississippi*

**REPORT DOCUMENTATION PAGE**

*Form Approved  
OMB No. 0704-0188*

The public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

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<b>1. REPORT DATE (DD-MM-YYYY)</b> 15-03-2006		<b>2. REPORT TYPE</b> Conference Presentation Abstract		<b>3. DATES COVERED (From - To)</b> Jan. 2005-March 2006	
<b>4. TITLE AND SUBTITLE</b> Radiometric Calibration Assessment of Commercial High Spatial Resolution Multispectral Image Products				<b>5a. CONTRACT NUMBER</b> NASA Task Order NNS04AB54T	
				<b>5b. GRANT NUMBER</b>	
				<b>5c. PROGRAM ELEMENT NUMBER</b>	
<b>6. AUTHOR(S)</b> Kara Holekamp(1) David Aaron (2) Kurtis Thome (3)				<b>5d. PROJECT NUMBER</b> SWR C15C-JC15-00	
				<b>5e. TASK NUMBER</b>	
				<b>5f. WORK UNIT NUMBER</b>	
<b>7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)</b> (1) Science Systems and Applications, Inc., Bldg. 1105, John C. Stennis Space Center, MS 39529 (2) South Dakota State University Satellite Calibration Group & Image Processing Lab, 501 East Saint Joseph Street, Rapid City, SD 57701 (3)University of Arizona Remote Sensing Group, 1630 E University Blvd Tucson AZ 85721-0094				<b>8. PERFORMING ORGANIZATION REPORT NUMBER</b>	
<b>9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)</b> Applied Research & Technology Project Office, Code PA30, John C. Stennis Space Center, MS 39529				<b>10. SPONSORING/MONITOR'S ACRONYM(S)</b>	
				<b>11. SPONSORING/MONITORING REPORT NUMBER</b> SSTI-2220-0066	
<b>12. DISTRIBUTION/AVAILABILITY STATEMENT</b> Unclassified/Publicly available STI per NASA Form 1676					
<b>13. SUPPLEMENTARY NOTES</b> JACIE Civil Commercial Imagery Evaluation Workshop, March 14-16, U.S. Fish and Wildlife Service National Wildlife Visitors Center, Laurel, Maryland					
<b>14. ABSTRACT</b> Radiometric calibration of commercial imaging satellite products is required to ensure that science and application communities can better understand their properties. Inaccurate radiometric calibrations can lead to erroneous decisions and invalid conclusions and can limit intercomparisons with other systems. To address this calibration need, satellite at-sensor radiance values were compared to those estimated by each independent team member to determine the sensor's radiometric accuracy. The combined results of this evaluation provide the user community with an independent assessment of these commercially available high spatial resolution sensors' absolute calibration values.					
<b>15. SUBJECT TERMS</b> radiometric calibration, radiometric accuracy, GeoEye, IKONOS, DigitalGlobe, QuickBird, OrbView					
<b>16. SECURITY CLASSIFICATION OF:</b>			<b>17. LIMITATION OF ABSTRACT</b>	<b>18. NUMBER OF PAGES</b>	<b>19a. NAME OF RESPONSIBLE PERSON</b>
<b>a. REPORT</b>	<b>b. ABSTRACT</b>	<b>c. THIS PAGE</b>			Thomas Stanley
U	U	U	UU	1	<b>19b. TELEPHONE NUMBER (Include area code)</b> (228) 688-7779