Evaluate the calibration of Dove and Dove-R (VHR) satellite data from the PLANET constellation

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Purpose: Assess the radiometric accuracy of imagery for scientific research

Study Objective: Analyze the radiometric calibration accuracy of PlanetScope imagery using 6 months of imagery over 67 calibration sites

Imagery: PlanetScope

Findings: The results show that the radiometric calibration accuracy of PlanetScope imagery needs improvement to support robust scientific investigations. Each instrument needs to be characterized prior to launch, calibrated while in flight, and these calibrations assessed independently throughout the instrument's lifetime. In-flight calibration should be achieved by a combination of on-board system and/or vicarious calibration methods (Moon, Cloud, Rayleigh Scattering, etc.). The calibration information and methods need to be made available to the scientific community: this is fundamental for using Planet data in time series analyses.

		Planet		Terra	
	Number of Observations	Calibration Ratio	Standard Deviation	Calibration Ratio	Standard Deviation
January	244	1.021	0.055	0.992	0.030
Feburary	257	1.037	0.060	0.993	0.026
March	262	1.038	0.056	0.996	0.023
April	312	1.030	0.061	0.993	0.026
May	342	1.036	0.063	0.995	0.025
June	284	1.039	0.067	0.996	0.023
Mean		1.033	0.060	0.994	0.025

		Planet		Terra	
	Number of Observations	Calibration Ratio	Standard Deviation	Calibration Ratio	Standard Deviation
January	244	1.050	0.078	1.001	0.035
Feburary	257	1.065	0.103	1.001	0.031
March	262	1.063	0.092	1.001	0.025
April	312	1.045	0.073	0.998	0.033
May	342	1.062	0.069	1.001	0.029
June	284	1.061	0.067	1.001	0.029
Mean		1.058	0.079	1.000	0.030

Calibration Ratios and Standard Deviation for PlanetScope and MODIS-Terra computed against MODIS-Aqua in the NIR (top) and Red (bottom) bands at 67 sites. Compared to MODIS-Terra, PlanetScope calibration ratio standard deviations was 2.3 times in the NIR and 2.6 times in Red band.