Modulation Transfer Function (MTF)

Fundamental measure of imaging system quality (sharpness)

MTF Methodology

Classical slant-edge measurement is employed.
Fixed high contrast targets are used to obtain the MTF measurements in the center of the array.
Measurements from specialized targets are used to confirm the measurements from the operational imagery.

MTF Results

MTF = .14 +/- .01 (1σ)

There was no statistical difference between the OV-3 initial on orbit measurement of .15 +/- 0.01 (1σ) and the MTF measured in 2005 (MTF = .14 +/- .01 (1σ)).

The current result is within the measurement error of the previous result, therefore no change in MTF was detected.

MTF measurements were taken from high contrast edges in the stereo T&E images.

In an effort to minimize atmospheric refraction the collection strategy will be adjusted in future collections to acquire near nadir imagery for MTF analysis.

Radiometric Calibration Methodology

Relative Radiometric Calibration
Reduced pixel to pixel variation (streaking and banding)

Absolute Radiometric Calibration
Defines the relationship between the focal plane digital numbers to the physical units of spectral radiance (mW/cm²/str/μm)

Radiometric Correction
Second-order fit to detector response for calibration coefficients.

Verification
Absolute: Vicarious calibration
Relative: Streaking / Banding metrics

Streaking and Banding
Relative radiometric assessment
Streaking
% diff. between a pixel response and the average response of adjacent pixels

Banding
% diff. between a group of pixels and the average response of adjacent groups

Relative Radiometric Assessment Results

PAN Streaking

MSI Streaking

PAN Banding