CALIBRATIONS OF FORMOSAT-2 SATELLITE

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On May 21, 2004 (Taipei time), FORMOSAT-2, Taiwan's first high-resolution remote -sensing satellite was launched successfully and placed onto its mission orbit later. The mission of FORMOSAT-2 is to image all over the world for land use, environmental monitoring, agricultural survey, coast search, academic research, and disaster evaluation.   The mission orbit , a 14 re v/day repetitive circular Sun-synchronous orbit , is a daily revisiting orbit that almost can acquire the image over the same target site everyday only with very small deviation. The remote sensing instrument (RSI) on board has , in the nadir direction , a swath width of 24 km, and can provide images with 2 m ground sampling distance (GSD) in panchromatic band and with 8 m GSD in four multi -spectral bands. The field of regard of the satellite is ±45 deg for along -track and cross -track viewing .

   Quality of images is always what we most concern about. To have images with good quality, so me works shall be done at the beginning, especially the geometric and radiometric calibrations. Geometric calibration can further be divided into two   parts, which are relative and absolute calibrations respectively. The relat ive geometric calibration is to mitigate the band to band shift in MS image which depends on the attitude the satellite is when imaging and ranges from   0.1~0.3 pixel at small viewing angle to few pixels at large angle. The absolute geometric calibration is to improve the geometric accur acy of image by fine-tuning the ge ometric parameters using existing GCP database and statistic method. This work is cooperated with IGN. Similarly, the radiometric calibration also has it corr esponding parts as in geometric calibration. In relative radiome tric calibration, the removal of column stripes in image is the main task. The reason of this defect is because of the unequal response s of each pixel in CCD array and can be erasing by applying the compensation coefficients obtained from calibration. As f or the absolute radiometric calibration, cooperated with CNES, the conversion factor of converting the gray value to actual   receipted radiance will be obtained and it will help in many fields such as agriculture. In this paper, the detail of the works will   be addressed and some calibrated results will also be presented.