

Posted: Fri, Nov 22, 1991 2:44 PM EST

Msg: QJJB-1693-1556

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Subj: MODIS-N Specifications

TO: MODIS Technical Team:

MEMORANDUM FOR THE RECORD

11/22/91

SBRC has asked that the MODIS-N specification on system crosstalk in Paragraph 3.4.5.3.3 be reworded in terms of NEDL's rather than the present spec that calls for crosstalk of less than 1 LSB when one detector element is illuminated by LTYPICAL and the other(receiver) has no illumination.

Assuming a 12 bit A/D, most of the NEDL's range from 0.3-1.0 of the LSB. A few of the thermal channels have NEDL's that range from.03-.06 LSB, notably the HI bands and the sounding bands(33-36).

I would recommend that the specification be changed to say that the crosstalk shall be less than 0.5 NEDL(1-sigma). This is based on the consideration that the system noise is, by definition, 1 NEDL and if we treat crosstalk as an additional noise source(its actually more of an offset), the total noise will increase by approximately 11%. Secondly, testing for this effect is possible by examining the analog signal just prior to the A/D while illuminating a single pixel(possibly with a well focused laser).

A possible down side is the thermal channels having NEDL's that are small compared to a bit. For these channels, the crosstalk of 0.5 NEDL could range from 8-15 counts for a signal of LTYPICAL.

The place where this requirement will probably be most difficult to meet is Bands 1 and 2 (the 250 meter bands) since the detector elements are small and crosstalk in silicon detectors increases in the red portion of the spectrum. The recent change to allow a 6% gap between elements will help alleviate the problem.

William L. Barnes