

TO: NGST Systems Engineering (J. Burt), Prime Contractors (M. Menzel, J. Crocker)

FROM: ISIM Manager (P. Geithner)

SUBJECT: Detector Temperature Requirement for NGST Near Infrared (NIR)

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Thermal and cryogenic designers involved in NGST architecture and instrument studies should assume an operating temperature requirement of 30 K (+0/-2 K) for science instrument NIR detector arrays. This value enables the use of Indium Antimonide (InSb) detectors based on current knowledge of InSb performance and the allowable dark current consistent with the NGST mission requirement for Zodiacal background-limited observations. Correspondingly, the required detector temperature is chosen so as not to preclude the choice of either InSb or Mercury Cadmium Telluride (HgCdTe) -- the NIR options for NGST. This requirement will be reviewed periodically as bench test results for NGST prototype InSb and HgCdTe arrays become available (the next results are anticipated in late 2000).

This required temperature is to be considered the acceptance limit, or not-to-exceed temperature, and thermal designers should factor appropriate heat load margins in their designs and analyses. Mission and instrument planners proposing to allow a detector temperature higher than 30 K must thoroughly investigate its impact on the NGST's ability to meet mission requirements. Adequate thermal and cryogenic design margin must always be demonstrated under worst-case end-of-life design conditions based on the selected temperature.

cc: NGST Prime Contract COTR (L. Purves)
ISIM Team