



CCD procurement plan July 06

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SURVEY

- Yield can vary between lots but is fairly uniform within a lot
- When Dalsa gets started – processing can proceed quickly (8-12 weeks) but sometimes we are not their highest priority
- Processing at LBNL takes 12 weeks for the first 5 wafers and then can sustain a rate of 5 wafers/month.
- Processing at Dalsa is ~ 6k/wafer, processing at LBNL is \$17.5k/wafer

R&D Plans:

- Develop a mask with four 2kx4k CCDs to minimize processing costs
- Order 1 Lot for development of packaging and testing procedures
- Order 4 lots: 80 wafers with potential for focal plane CCDs (Lots 2A-D)
- Process 5+ wafers per lot at LBNL to determine Lot yield and rate

Production (once MIE funds are approved):

- Order another lot if yield is < 25%
- Initiate processing at LBNL of remaining wafers (schedule assumes Nov 07 start) ~18 months



CD1 Directors review -recommendations

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- Add another lot to the base program
- Reviewer comments: Some devices that are procured with R&D funds might end up on the focal plane – work out a plan to follow the rule: R&D should not be used to cover production costs.
- DES response:
 - Another lot (3A) is being added.
 - Estimate the cost and number devices procured on R&D funds that will ultimately pass all the tests.
 - Include those costs in the MIE
 - This is double counting, but seems to be the only way to do it.



CCD yield and Contingency

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- Lot 2 is 78 wafers, 25 will be processed at LBNL on R&D
- Out of these 25 wafers, the devices with potential to go on the focal plane will be held in reserve until the final package is developed and MIE funds are available.
- Lot 3: another 24 wafer lot (20 useable wafers) all on MIE
- Total number of wafers processed at LBNL on MIE funds:
 - 53 Lot 2
 - 20 Lot 3
- Assuming a yield of 25% we would have 73 good devices all processed at LBNL on MIE funds
- With the Lot 2 R&D wafers(25) we could handle an 18% yield
- With the Lot 1 R&D wafers (15) ~ a 16% yield
- If it is even lower, we will order a contingency Lot – this will cover down to a yield of 13.5%

- If the yield is $\geq 25\%$ we would not need to order Lot 3 or the contingency lot (\$470k each)



MIE Costs to cover devices from R&D

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- Lot 2 R&D:
 - Dalsa: Procurement of partially processed wafers in Lots of 24 wafers each. Cost: \$6k/wafer. Distribution of costs
 - Four 2kx4k: \$1200 each
 - One 2kx2k: \$600 each
 - Four 0.5kx1k: \$150 each
 - LBNL: Thinning, Processing and testing \$17.5k: distribution
 - Four 2kx4k: \$4000 each (these are tested)
 - One 2kx2k: \$1000 each (not tested)
 - Four 0.5kx1k: \$150 each (not tested)
- All 78 of the Lot 2 wafers are purchased on R&D, of those, 25 will be processed at LBNL on R&D, 53 on MIE.
- We need 72 2kx4k and 20 2kx2k including spares
- Assuming a 25% yield the costs we may need to add to the MIE are:
 - $53 * (\$1200) + 20 * \$600 = \$75,600$ for the Dalsa costs (LBNL proc. on MIE)
 - $25 * (\$1200 + \$4000) = \$130,000$ for the Dalsa + LBNL costs on Lot2 R&D
 - $10 * (\$1200 + \$4000) = \$52,000$ for Dalsa + LBNL Lot1 R&D