SQIID Supplement

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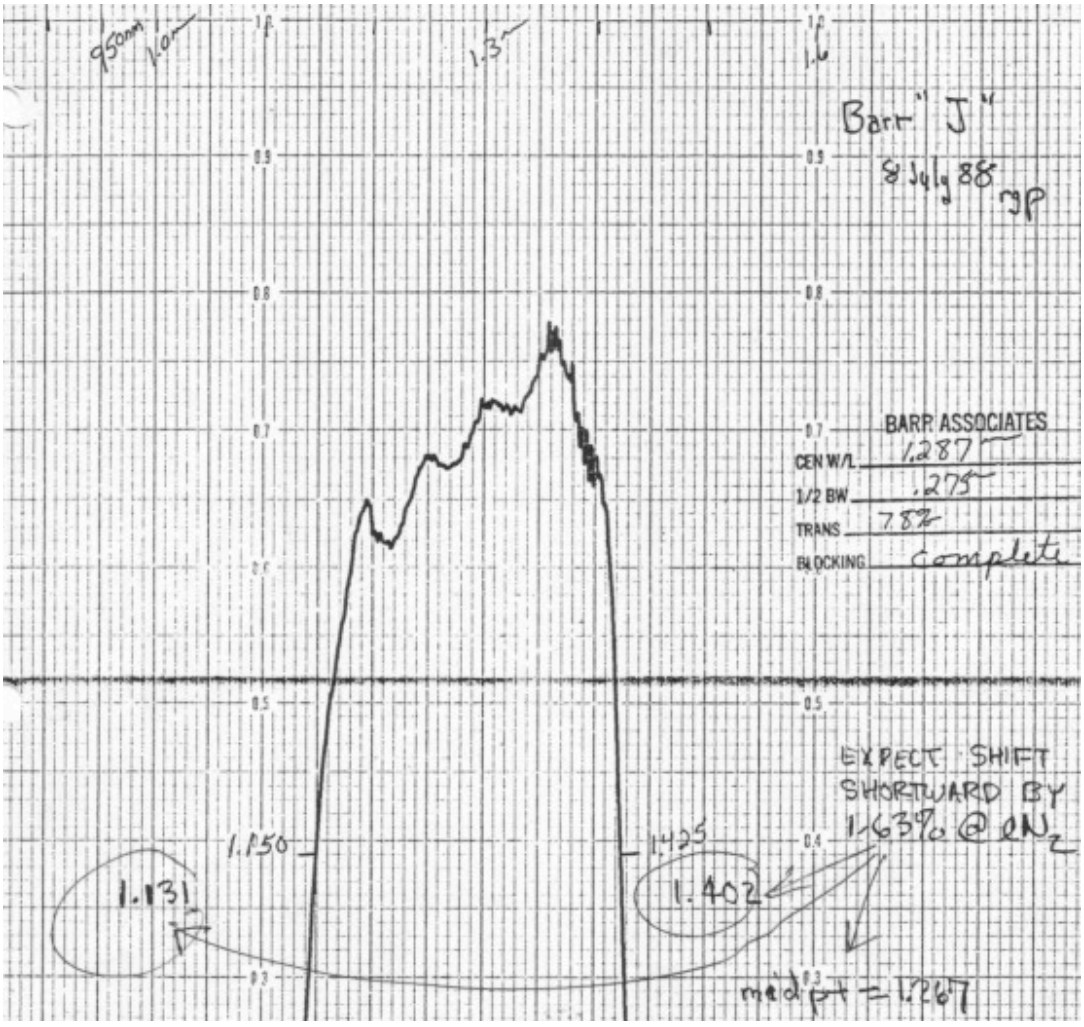
Filter Transmission



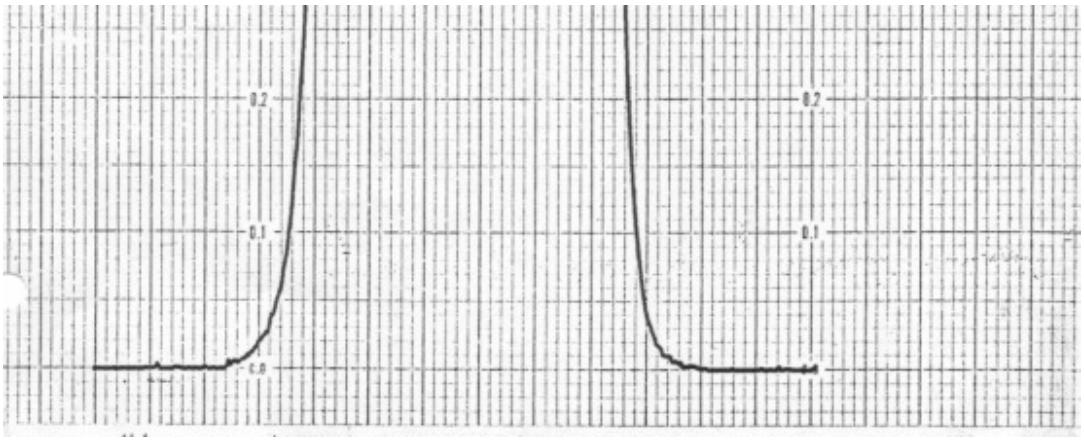


Fig. 1 Warm transmission for the J Channel Filter. We assume the standard wavelength shift and transparency improvement at 77K

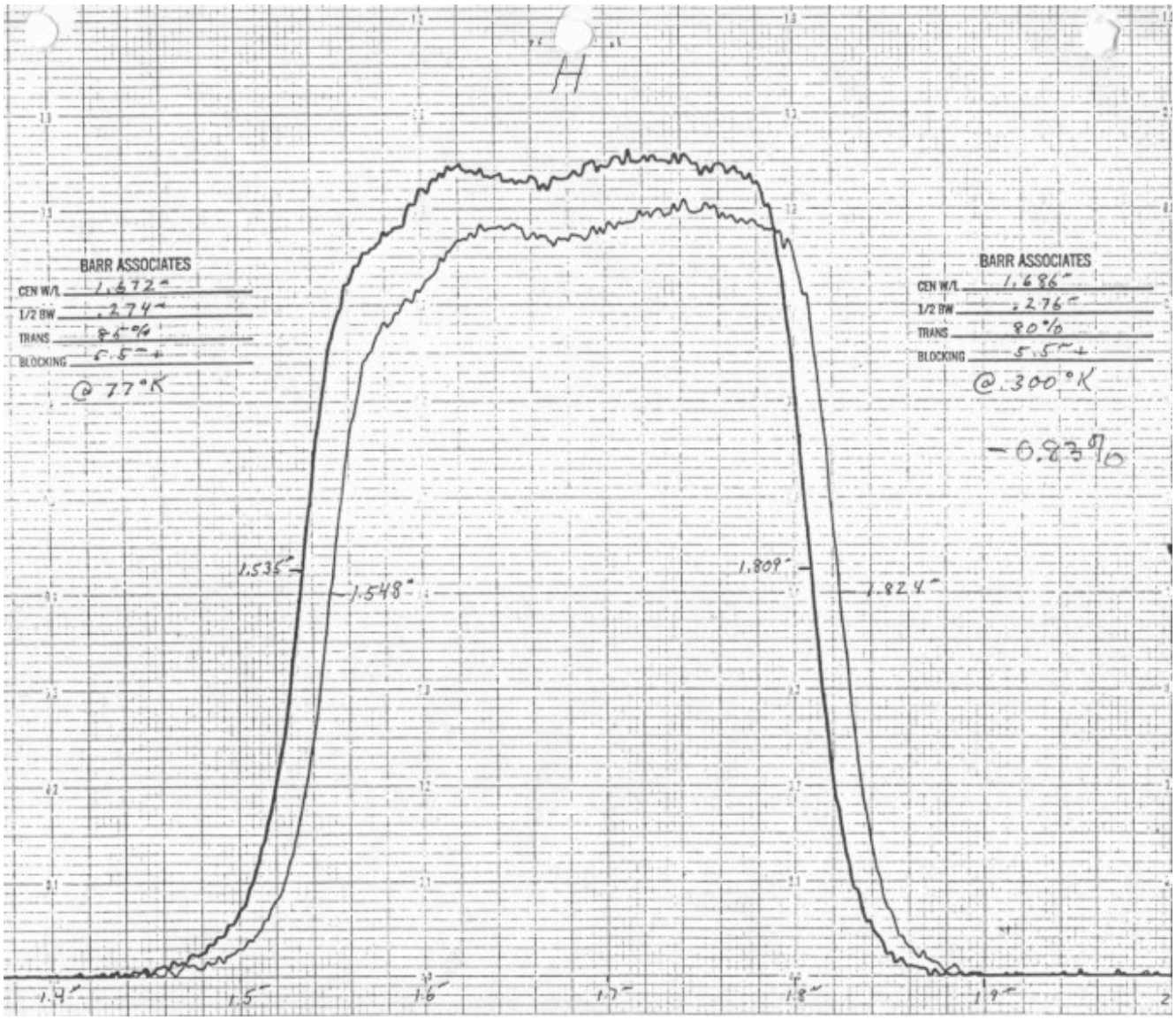


Fig. 2 Warm and cold transmission for the H Channel Filter. Note the wavelength shift and transparency improvement at 77K

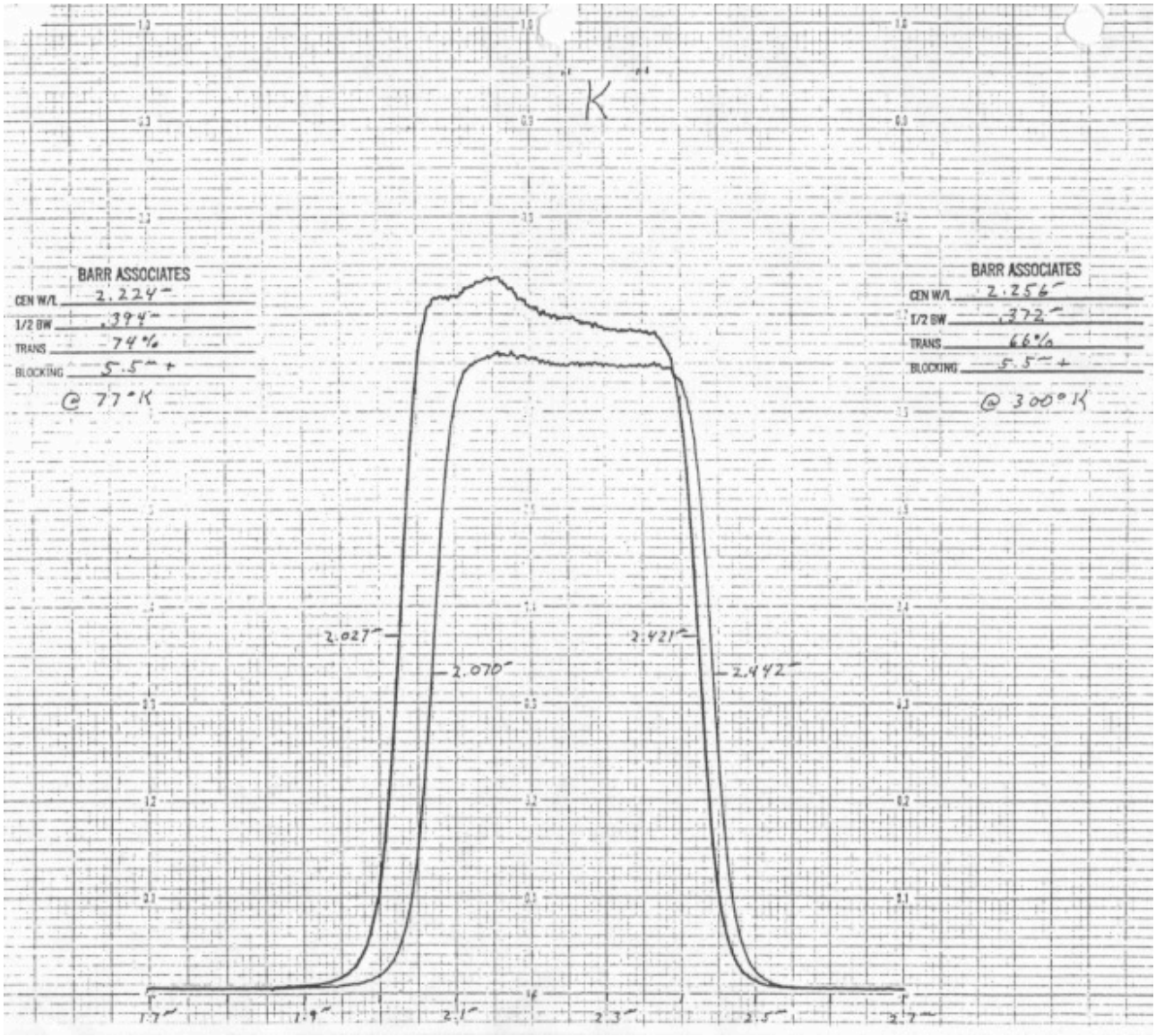


Fig. 3 Warm and cold transmission for the K Channel Filter (prior to 02/2002). Note the wavelength shift and transparency improvement at 77K

Geometric Distortion

Within the original central 256X256 FOV, the geometric distortion for SQIID was less than a pixel. However, given the factor of 4 de-magnification, one expects the geometric distortion within the full 512X512 FOV to be significant. Fig. 4-8 depict the predicted geometric distortion, based on an as specified rather than as built optical model. X's mark where grid intersections in the input image should appear at detector. Each channel is plotted on the smae scale and then plotted with the distortion magnified by a factor of 10.

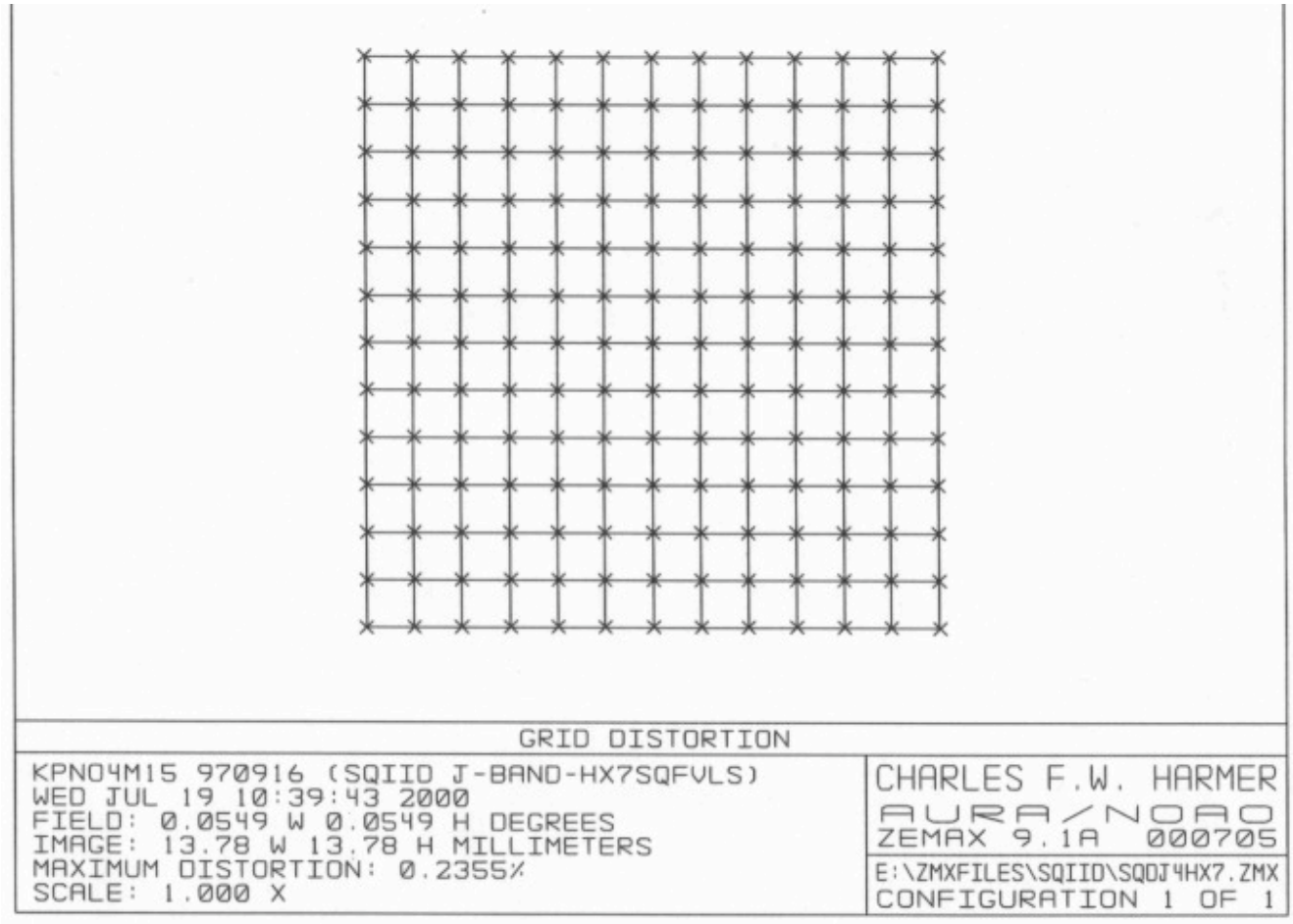
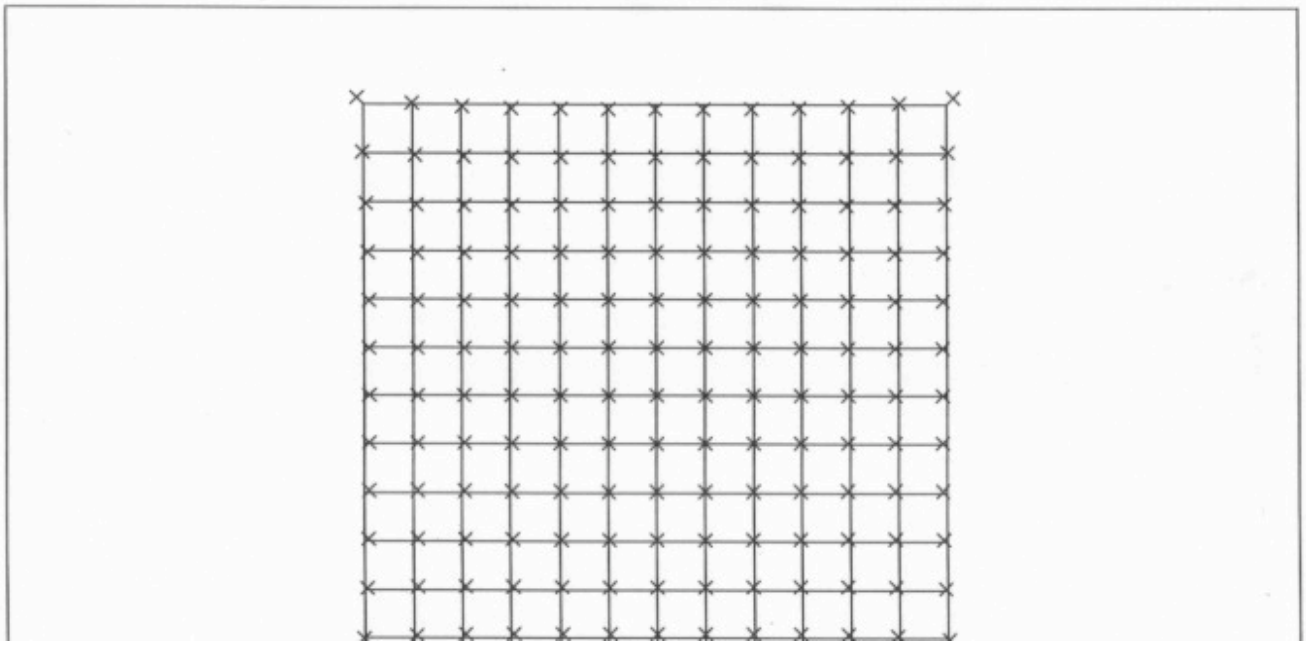


Fig. 4 Predicted Geometric distortion for J Channel. X's mark where grid intersections should appear at detector. Units are in pixels.



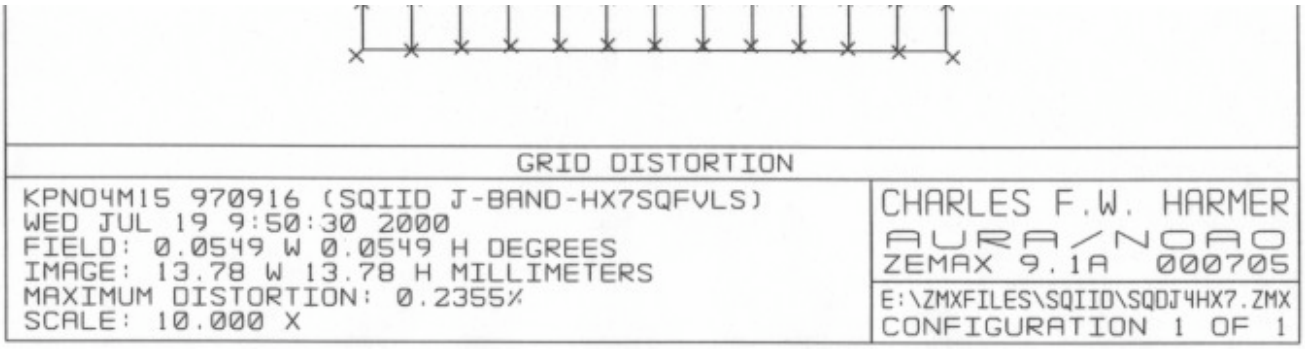


Fig. 5 Predicted Geometric distortion for J Channel. Distortion is magnified by a factor of 10. X's mark where grid intersections should appear at detector. Units are in pixels.(

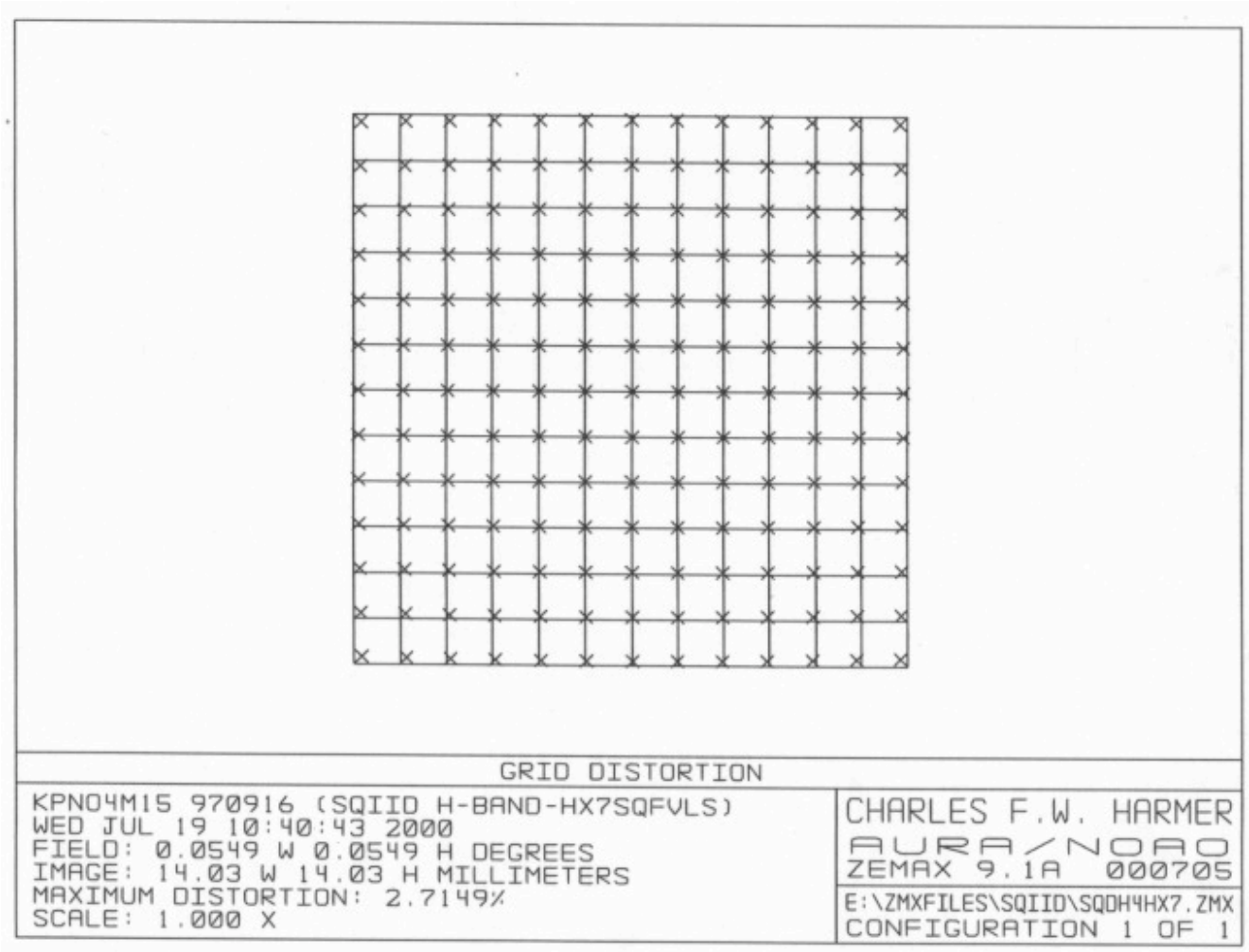


Fig. 6 Predicted Geometric distortion for H Channel. X's mark where grid intersections should appear at detector. Units are in pixels.

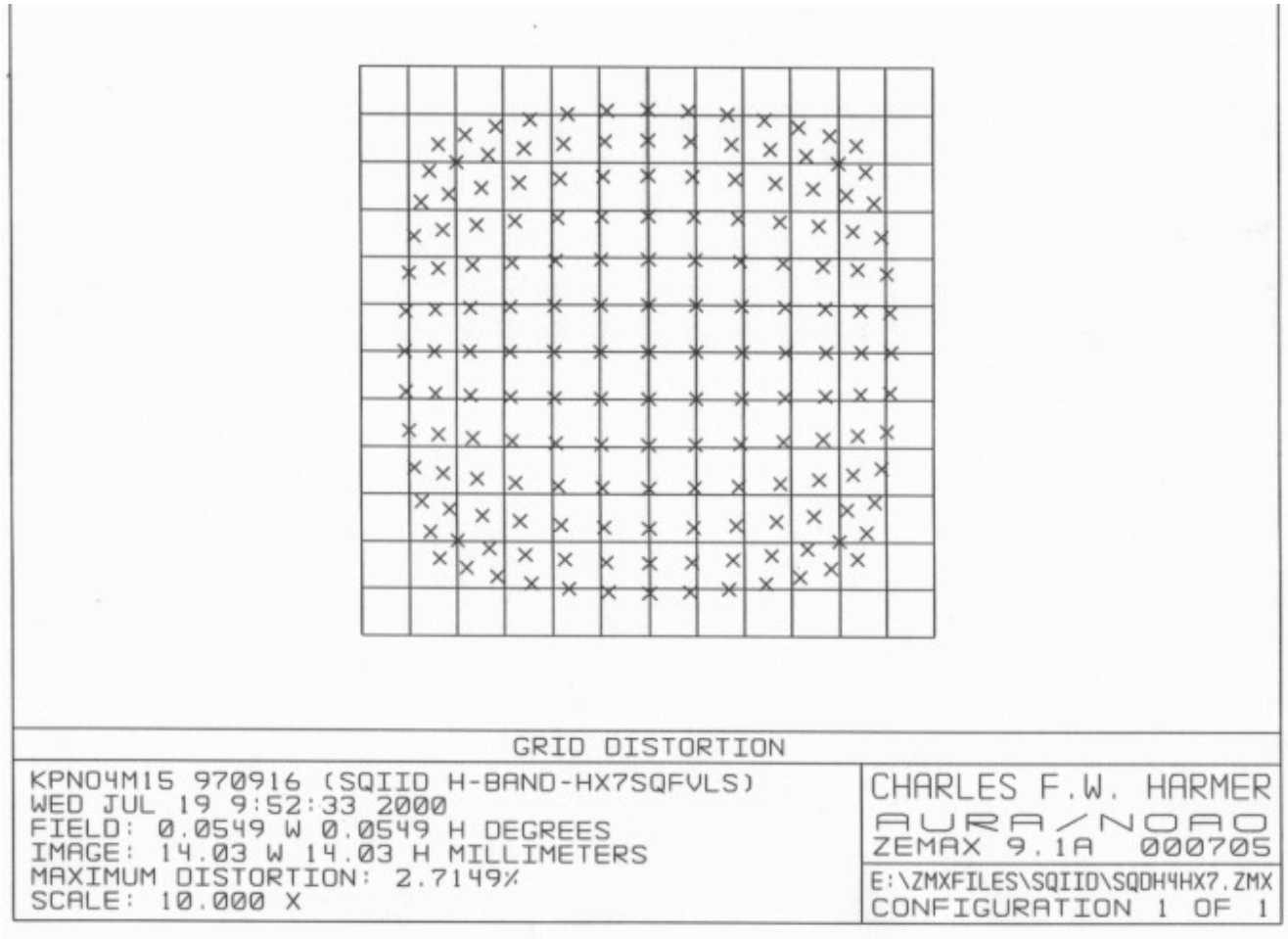
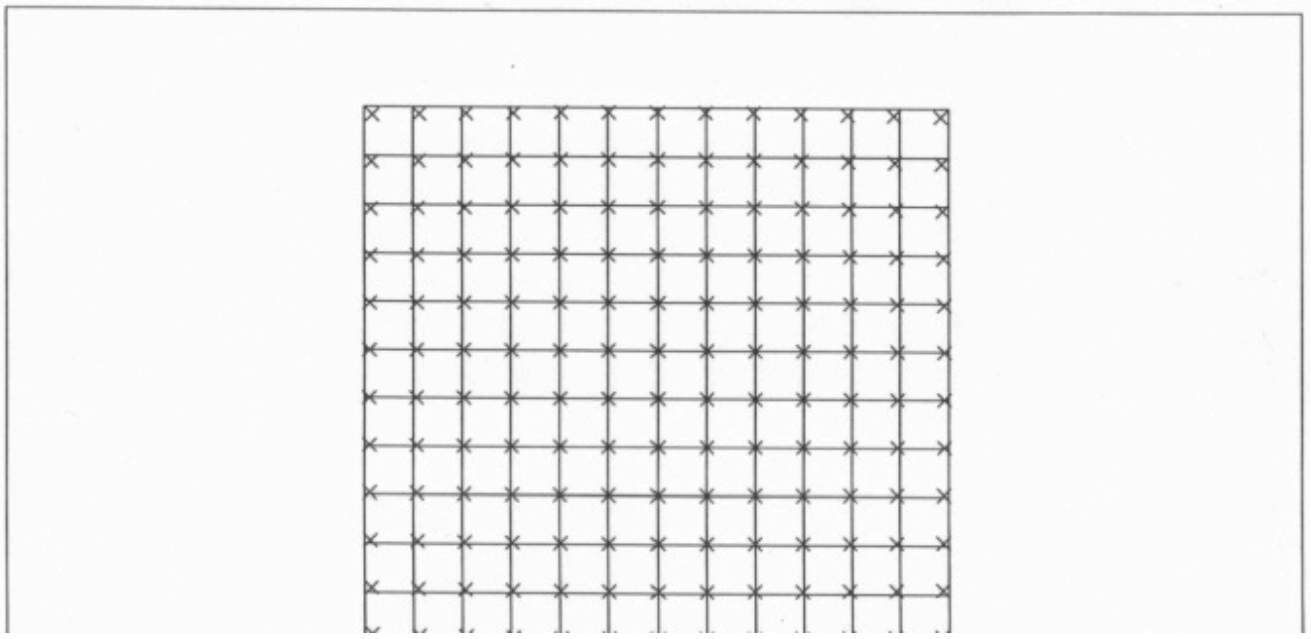


Fig. 7 Predicted Geometric distortion for H Channel. Distortion is magnified by a factor of 10. X's mark where grid intersections should appear at detector. Units are in pixels.(



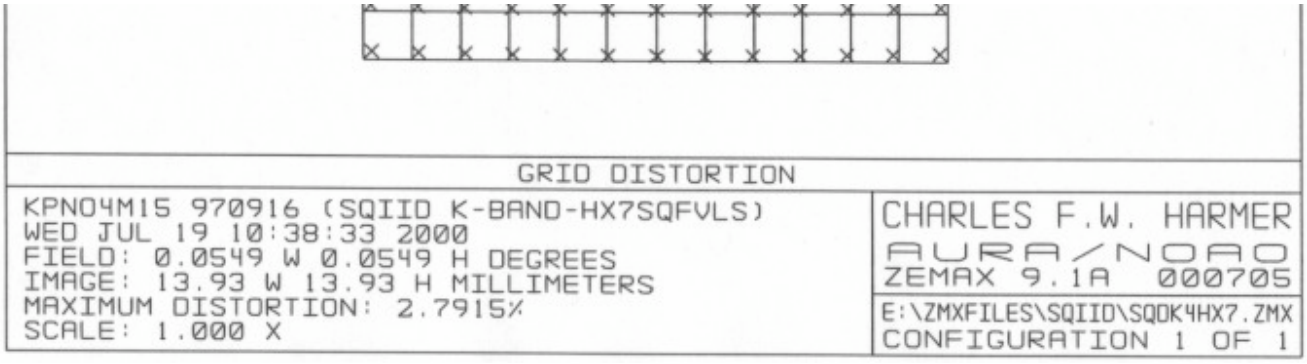


Fig. 8 Predicted Geometric distortion for K Channel. X's mark where grid intersections should appear at detector. Units are in pixels.

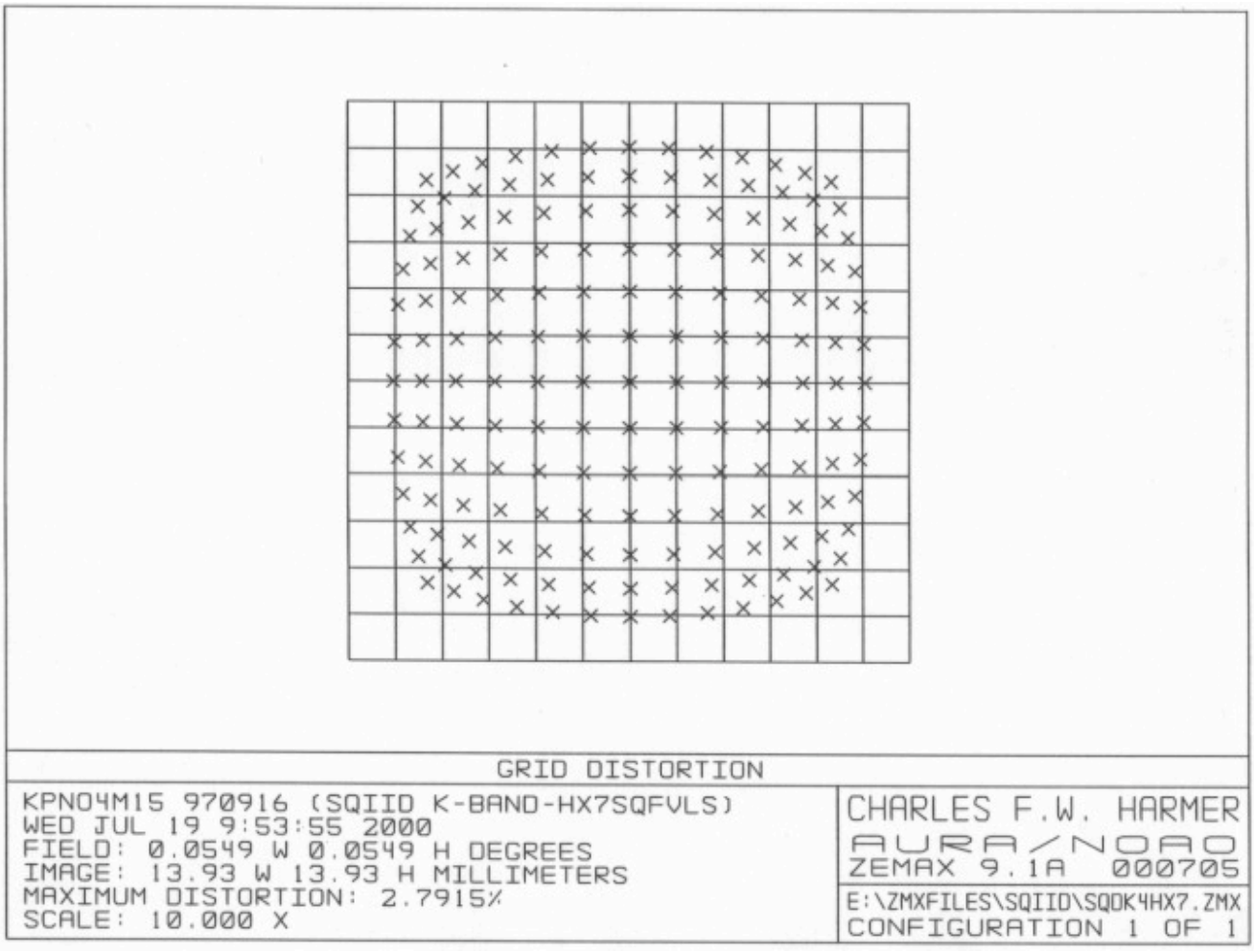


Fig. 9 Predicted Geometric distortion for K Channel. Distortion is magnified by a factor of 10. X's mark where grid intersections should appear at detector. Units are in pixels.(

The absolute geometric distortion should be dominated by a radial term which goes as the cube of the planar distance from the optic axis. To investigate this, point by point comparisons were made betwwen images of a rich field (the Galactic center) taken with the USNO Astrocam (which has been designed to

minimize distortion across the field) and SQIID. After correction for relative magnification and orientation, the residual difference in the radial ditance between Astrocam and SQIID is plotted in Fig. 10 as a function of radial distance in SQIID. Further observations, using SQIID observations of fields rich in astrometric well determined sources and/or comparisons with images known to of low distortion are required to adequately determine the absolute distortion a J, H, and K. The *relative* distortion among the SQIID channels can be determined on the basis of SQIID observations of rich fields.

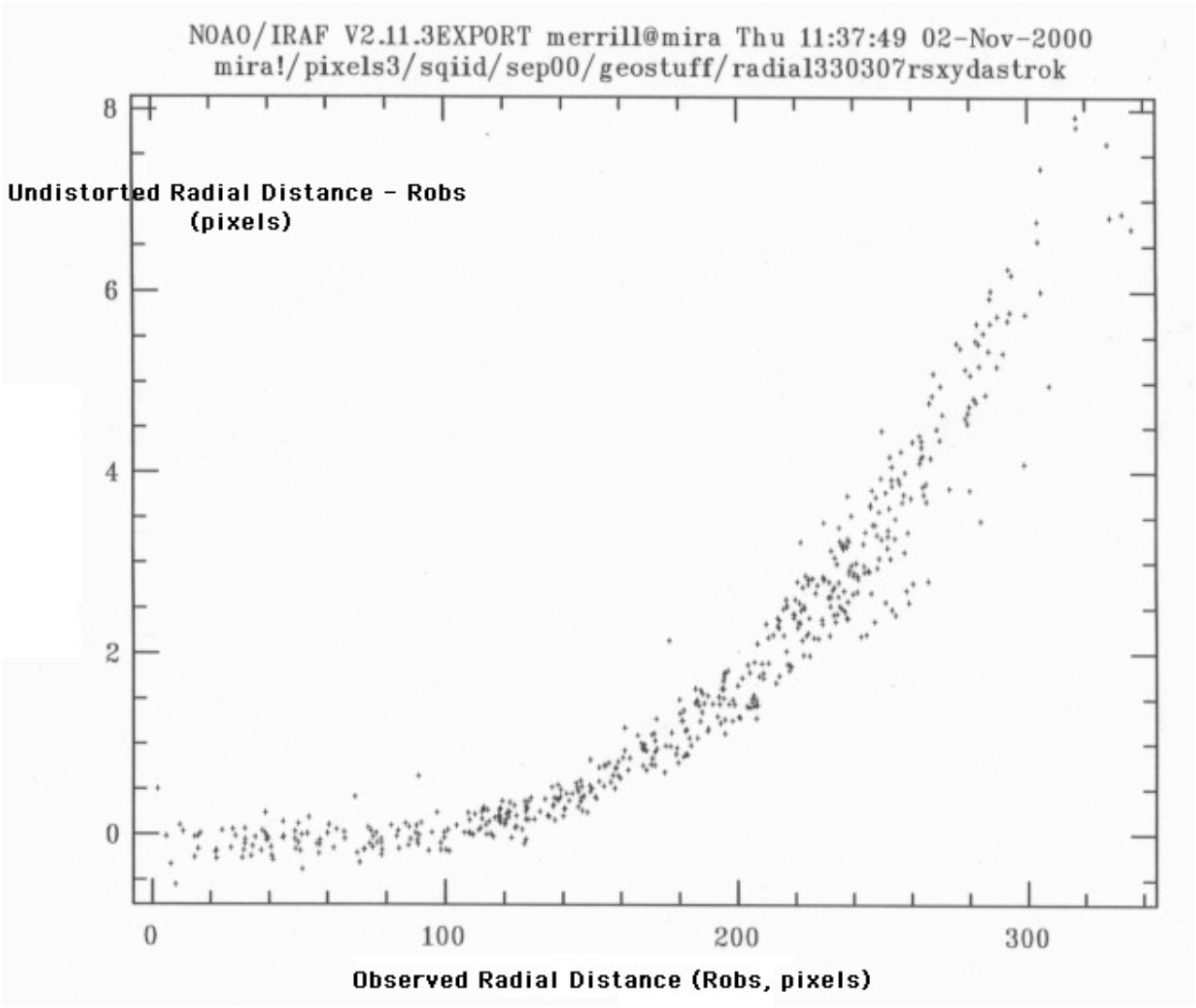


Fig. 10 Measured Radial distortion for K Channel.

Pixel Masks

The following images are representative pixel masks for the J, H, K channels of SQIID, including the combined effects of intrinsically bad pixels and instrumental vignetting. Orientation on the sky is east at the left and north at the top. The active area of each array is masked to keep confine the incident light to the active area. There is additional vignetting which arises within the SQIID optical chain. A fold mirror housing produces the soft vignetting on the east side. The rounded corners come dichoric and/or mirror mounts. The minor vignetting near the center of the west/right edge comes from a mounting clip. The polarizer is actually too small for the full field, so if the internal cold slide is in the polarizer position rather than the open position, the clear region will be further constrained on all sides (and the signal will be 50% of normal).

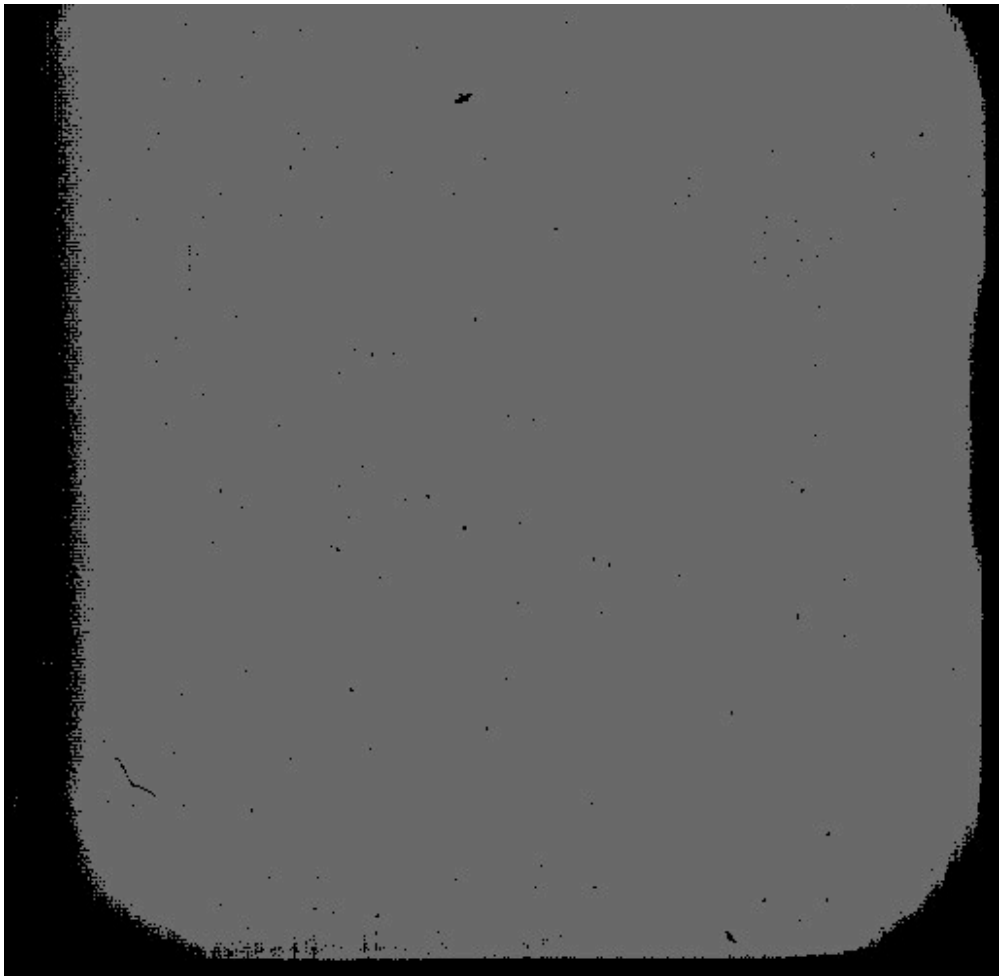


Fig. 11 Representative J Channel bad pixel mask (includes intrinsically bad pixels and intrumental vignetting). North is up and east is left.

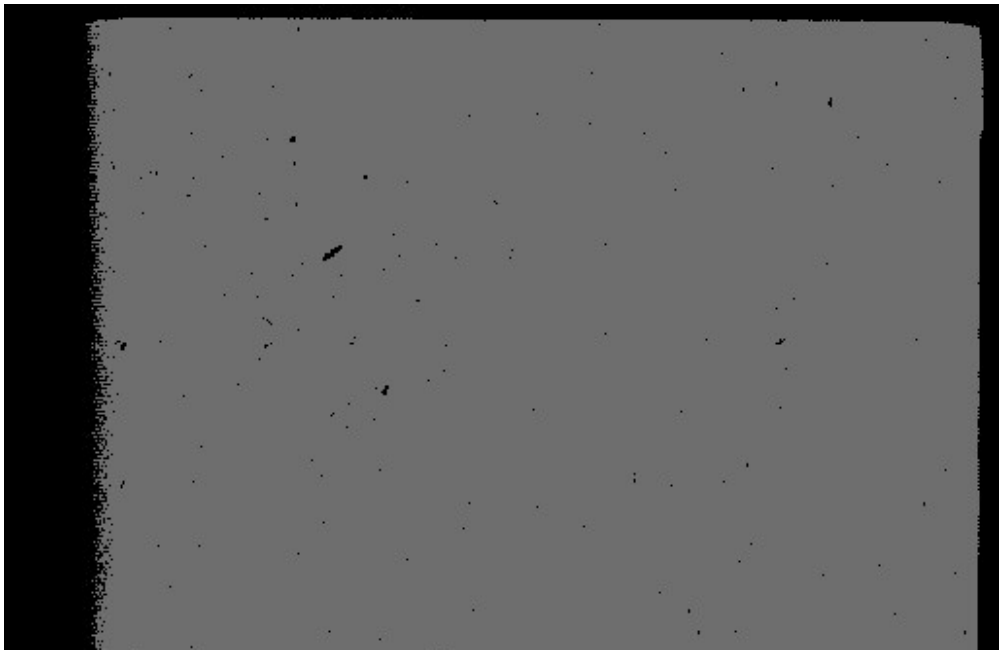


Fig. 12 Representative H Channel bad pixel mask (includes intrinsically bad pixels and intrumental vignetting). North is up and east is left.

Fig. 13 Representative K Channel bad pixel mask (includes intrinsically bad pixels and intrumental vignetting). North is up and east is left.

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