

the controller are software controllable, special or custom read-out sequences (such as drift-scan or skipper amplifiers) can easily be implemented.

Work is currently focussed on what additional elements are necessary to create a complete controller. At a minimum the system must be capable of stand alone operation and have an image display. Both of these features are present in the current Generation II controllers and have proven essential to efficient operation. Currently the work group is trying to divide the display, memory, processing power, and secondary storage requirements between the CCD controller and the data acquisition system.

Current plans call for acquisition and development of the system to begin during 1st quarter 91, testing during 2nd quarter 91, and implementation for second semester 1991.

*Christopher Clark and Steve Massey*

## Optical Tests of the Prime Focus Wide Field Corrector

Prime focus images using the Wide Field Corrector are seldom better than 0.6" FWHM, and never better than 0.5". However, images obtained with the High Resolution Camera at the same focus have been as good as 0.35" or even better. Since this difference in image quality is difficult to explain entirely in terms of image stabilization provided by the HRC, and since the WFC had not previously been subjected to rigorous optical tests, the corrector has been tested interferometrically in the lab.

We were fortunate enough to be able to rent a phase-shift Shack cube interferometer from the Optical Sciences Center of the University of Arizona, together with the gracious services of Dick Sumner the head of their optical fabrication group for a week in October. The Shack unequal path (LUPI) interferometer with its phase-shifting capability can reproducibly measure wavefront errors as small as 1/100 wavelength. In our test setup, the divergent beam from the interferometer's spatial filter passed through the wide field corrector to a high quality spherical mirror which then returned the beam through the corrector

back to the interferometer. The reference sphere, stopped down to f/3.77, was checked separately with the same equipment so that any surface errors it introduced could be subtracted from the wavefront map of the corrector-sphere combination. Although the interferometer-corrector-sphere were mounted on a steel frame on air-bearing isolators the system was (painfully) sensitive to vibration. Tests could only be conducted at selected times of the day when all building motors could be turned off.

We are glad to report that the optical quality of the corrector is better than we had expected it might be. Although considerable care had been taken previously in centering and squaring on each of the corrector's three lenses we had anticipated seeing some hint of either pinched lenses or misalignment.

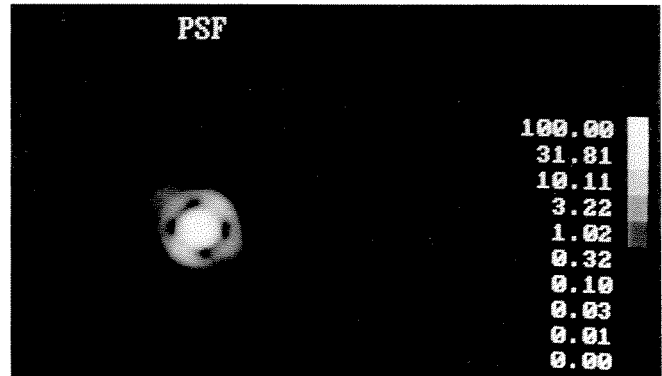


Fig. 12: The diffraction limited image calculated from the wavefront of Figure 11. The diameter of the first null ring is 0.09".

Quite pleasantly this was not the case. In fact, the on-axis, single-pass performance of the corrector alone (as expected in use on the telescope) is 0.43 waves peak to valley, and 0.075 waves r.m.s. wavefront error at 6328 Å, quite near diffraction limited operation. The principle contributors to the wavefront errors are third order spherical aberration and astigmatism. The wavefront map after removal of tilt and defocus, and a point source image calculated from this wavefront are shown in Figures 11 and 12. The diameter of the first zero ring of the diffraction image is 5.8 microns or 0.09".

*D. Salmon and S. Béland*

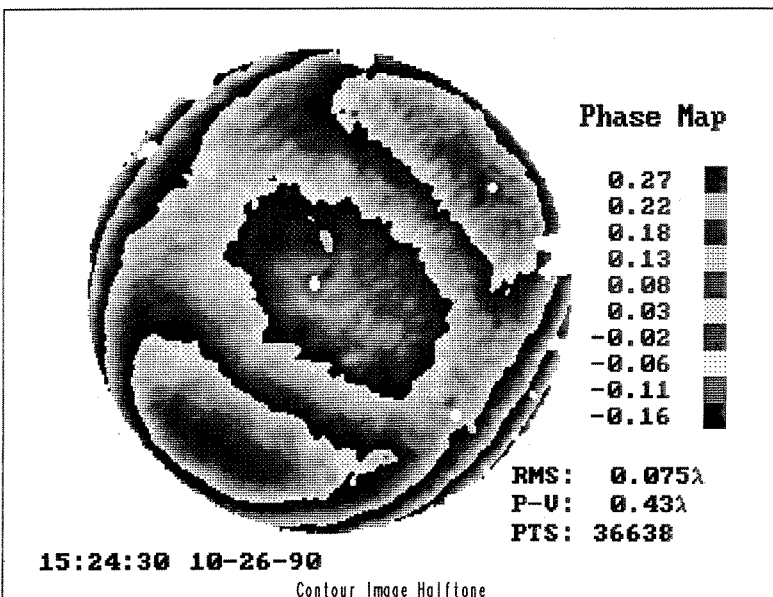


Fig. 11: The single-pass wavefront for the Wide Field Corrector

## Status of the Data Acquisition System X11 versus X10

The CFHT data acquisition system's user interface will soon be sporting a new look and feel. As of this writing, a X11/Motif based system has been written and used for the Lick1 2kx2k CCD engineering run. It is expected that most, if not all, of the CFHT instrument runs will be utilizing the new software by the first semester of 1990.

Converting the CFHT data acquisition user interface from X windows version 10 to version 11 was mandated by our continued reliance on standards. Vendor support for X10 will be discontinued in 1991, while X11 is widely available and accepted. Motif was chosen both because it uses X11 and to take advantage of it's user interface, which is very similar to that found on PC based