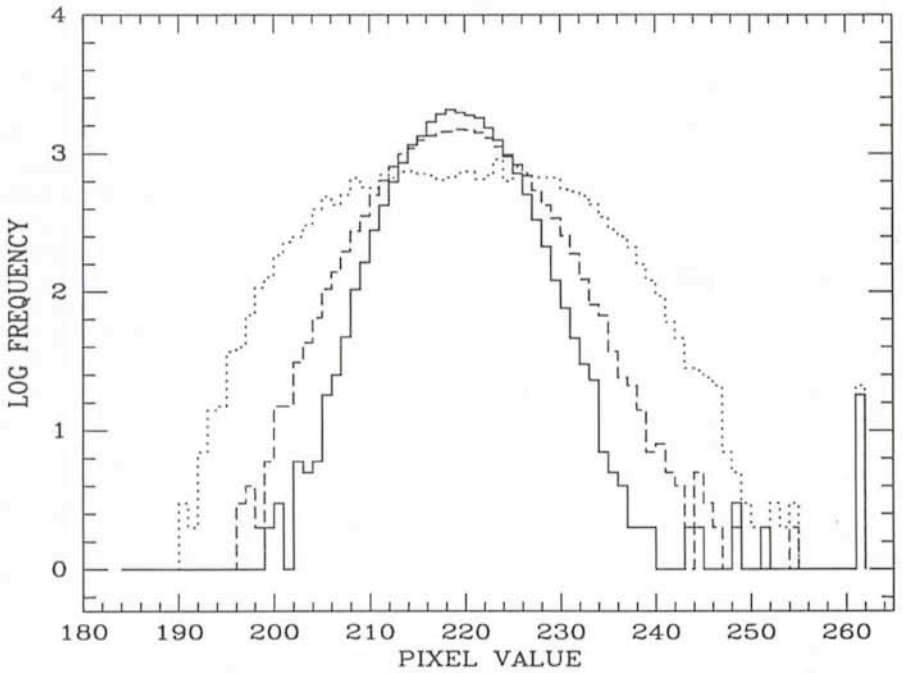

Figure 4: *The background statistics of the images. Dotted line: the input image; dashed line: an intermediate output; solid line: the final output. See the text.*

process. The distribution of pixel values for the input frame (dotted line) shows the wide, flat peak caused by the interference pattern noise. This is greatly reduced after the first pass through the FFT filter. At this stage the distribution of pixel values in the log-linear plot looks like an inverted parabola, suggesting that the distribution of values is nearly Gaussian. After the second iteration the width of the distribution has been further reduced, allowing improved detection of threshold stars. The use of a proper Wiener filter would result in optimal noise reduction but would require a MIDAS programme that could adjust the value of low amplitude signals in the transform domain by factors that depend on the signal amplitude. The cleaning procedure described here is logically very similar to the procedure by Adorf and Catchpole (1992) for creating a filter by isolating a domain in Fourier power space. The sharp edges of his domains are equivalent to a box filter, as is used here, rather than the optimal Wiener filter.

I am indebted to L. Lucy for pointing out the references to Wiener filtering.

References

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Adaptive Optics on the 3.6-m Telescope: Latest News!

After several strenuous months of assembly and testing, the Come-On-Plus Adaptive Optics system has finally come to life in the "Laboratoire d'Interférométrie Infrarouge et d'Optique Turbulente (LYOT)" of the Observatoire de Meudon, under ONERA's supervision. Thanks to LASERDOT, who designed the control computer and the deformable mirror, the closed-loop 40-Hz bandwidth performance (at 0 dB) has been achieved. The LEP (Laboratoires d'Electronique Philips) delivered the EBCCD (see *The Messenger* No. **67**), a low-flux wavefront sensor detector, which is a quantum noise limited detector with a switchable frame frequency from 25 to 400 Hz. The 52-actuator deformable mirror has been tested with successful results. The actuators, made of a very hard piezoelectric material, show no hysteresis or heat dissipation at all, and the mechanical bandwidth is more than 10 KHz (far more than required for an atmospherical turbulence correction). The surface quality is also very good: by means of a self-correction, the mirror can lower its own wavefront residual error to less than 20 nm rms. The whole system is now ready to be tested on the sky, under real conditions in December 1992.

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