



The La Silla News Page

The editors of the La Silla News Page would like to welcome readers of the ninth edition of a page devoted to reporting on technical updates and observational achievements at La Silla. We would like this page to inform the astronomical community of changes made to telescopes, instruments, operations, and of instrumental performances that cannot be reported conveniently elsewhere. Contributions and inquiries to this page from the community are most welcome.
(R. Gredel, C. Lidman)

Image Quality of the 3.6-m Telescope (Part VIII) New Seeing Record of 0.47''

S. GUISSARD, ESO

The bad behaviour of the lateral pneumatic support of the main mirror (M1) has already been put forward several times to explain the bad image quality of the telescope at large zenith distance. In order to check this assumption, several adjustments were done on the primary mirror support during the technical time last December. We decided to start by recentring the mirror axis on the rotator axis. This was done successfully and we found that the old position of the mirror was about 2 mm away from the rotator axis position. All the lateral pads supports were modified, and it is now possible to adjust them radially to match the new mirror position.

The lateral support system of the primary mirror is composed of 18 lateral pneumatic pads and 3 fixed pads. The pressure in the pneumatic pads is controlled via a mechanical computer, commonly called the "REOSC system" which provides a certain theoretical pressure to each pad according to the position of the telescope, the system therefore has 18 pressure controllers. For each pad, the pressure is a function of the declination of the telescope and hour angle. The problem of the system is that it can only be adjusted for a single

position of the telescope and that it does not follow accurately the theoretical law of pressure to be applied on the mirror edge. Furthermore even if that was the case, we proved that a pressure regulation of the air in the pneumatic pads is not sufficient. The reason for this is that because of flexures of the cell and small mirror motions, the distance between the pads and the mirror changes and modifies the contact area between the air cushion and the mirror. The direct consequence is that the force applied to the mirror is not the correct one.

The installation of load cells on all the lateral supports in April 1997, allowed us to do the following test adjustment for the telescope pointing at 45 degrees of zenith distance towards the South. The pressure into the pneumatic pads was adjusted on the REOSC system; then the distances between the pads and the mirror were adjusted until the correct lateral forces distribution could be read on the load cells.

During the following test nights we first tilted the secondary mirror (M2) to compensate for the coma introduced by the recentring of M1 and we measured the aberrations of the telescope for several zenith distances. The position of the

telescope for which the Optical Quality (OQ) was the best was between 30 and 45 degrees of zenith distance to the South, position for which the lateral adjustment of the forces was performed. The OQ at this position was around 0.27'' d80% which corresponds to the polishing errors of the mirrors. However for any other position of the telescope, including zenith, the OQ degraded for the reason explained above. To confirm the aberration measurements we also made several direct images at 30 degrees of zenith distance to the South and 15 second unguided exposures (the mirror ventilation was on). The FWHM measured on the star is 0.47'' d80% which breaks down the old record of 0.56'' obtained one year earlier. It must also be noticed that this new value has been obtained at 30 degrees of zenith distance and the old one at zenith. This new seeing record is very close now to the limit we can obtain with this telescope.

This year a new control system of the pressure will be installed. It works in closed loop with the force values read on the load cells, and it should enable us to get an excellent optical quality all over the sky.

EFOSC2 and VLT Autoguider Commissioned at the 3.6-m Telescope

R. GREDEL and P. LEISY, ESO

During three weeks of technical time in December 1997, EFOSC2 and the VLT autoguider were commissioned at the 3.6-m telescope. EFOSC2 is no long-

er offered at the 2.2-m telescope and replaces EFOSC1 on a permanent basis.

EFOSC2 is equipped with a 2048 × 2048 LORAL CCD and comes with a

sampling of 0.16 arcsec per pixel. It thus takes full advantage of the improved image quality of the 3.6-m telescope (see previous articles in *The Messenger* by