3.6-m Telescope Control System Upgrade Completed

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New highlights can be reported from the 3.6-m upgrade project: the full VLT-compliant Telescope Control System (TCS) has been finally tested and commissioned during recent technical-time periods. On August 9th it has been successfully put into routine operation. Let us briefly recall the milestones passed. The "heart" of the telescope, the servo control system for the axis, was completely modified. The telescope control is now based on so-called “Local Control Units” (LCUs), an identical hardware platform to that used at the VLT. It substitutes the over 20 years old TCS running on HP1000 computers. In contrast to the VLT and NTT, the 3.6-m is an equatorial mounted telescope, and the entire control SW had to be modified and adapted for controlling the alpha and delta axis. With the broad usage of standardised architectures and software concepts at the 3.6-m, which were originally designed and developed for the VLT, we intend to gain operational stability, quality, and maintainability. However, it also requires to replace proven components like the old, incremental encoders with optical strip encoders which are required to read the telescope position. The new encoders are supposed to deliver a five times higher resolution, but once we tested the performance of them in practice, we encountered an unexpected problem: in extreme telescope positions, implying several tens of tons of weight on the axis, the tight tolerances (±100 mm) required for reliable readings of the position were exceeded, thus loosing control over the telescope. Through careful adjustment of the heads we were able to restrict the “dead zone” to a very small region in the Northwest. In September, a dynamical mount for the reading heads will be installed, which is expected to completely solve this problem.

Work is also proceeding on other system components: The manual telescope control and the interlock system is being upgraded and adapted to the new control environment. The Infrared configuration (f/35) is being prepared for the arrival of TIMMI2 early next year and the CES refurbishment and upgrade is due in October. There are still minor issues to be clarified in order to fully understand the behaviour of the telescope. To maintain the already excellent image quality of less than 0.6 arcsec, both, operational and maintenance procedures have to be implemented and also an improvement of the f/8 top-end is presently being studied. All in all, close to 40 FTEs will have been invested into the upgrade of the 3.6-m telescope, and La Silla has gained vast experience in operating and maintaining VLT-era telescopes.

What do all these upgrades mean to the user, the visiting astronomer? First of all, the pointing and tracking performance is dramatically improved: a remarkable pointing accuracy of 5 arcsec rms is now achieved, and the drift rate is well below 1 arcsec per 10 minutes during free tracking, a value that was out of reach for the old system. In combination with the new TCS, the entire VLT-compliant software presently running in the 3.6-m was upgraded to the VLT-FEB99 Common Control Software release, implying full Y2K compliance of the system. With the help of DMD the archiving part of the data flow system (DFS) was implemented. All frames obtained with the EFOSC2 instrument are transferred via standard VLT/DMD data handling tools to a centralised La Silla archive, where compact disks are produced for each observing night. The use of the DFS also allows us to implement a data reduction pipeline, which we plan to offer for the most commonly used modes of EFOSC2 in the near future. It also allows us to enhance our instrument calibration database, and to ease data quality control checks.

Maybe the most important improvement in the 3.6-m that comes with the upgrade is its gain in operational stability and in the reduction of technical downtime. Beside the more reliable electronics used, the strict implementation of formalised procedures and checklists for daily start-ups, instrument set-ups and change-overs lead to a constant and significant decrease in downtime, comparing the 7% in 1998 (corresponds to 140 hours of total available observing time lost due to technical problems) with the 4% in 1999 (January–July, 60 h). In view of these numbers we ask the visiting astronomer to forgive us the inconvenience of finding the 3.6-m telescope building locked (like the NTT), which requires to call the operator on duty to grant access to the building. But also this action helps us to keep configuration control.

Finally we are happy to announce a new, very detailed EFOSC2 manual, including a description of the “neo-classical” observing strategy. It is available from the 3.6 Web pages (http://www.ls.eso.org.lasilla/Telescopes/360cat/efosc/html/doc/EFOSC2manula.ps.gz), and we invite all EFOSC2 observers to consult this manual in advance of their observations.

Without the constant enthusiasm and personal commitment of all the people involved, in particular the technical support teams at La Silla, the 3.6-m upgrade project would never have reached the current level of quality and success.

3.6-m Telescope Blind Tracking Performance

First Detection of the Methane Field Brown Dwarf SDSS 162414.37+002915.6 in i-Band