– Programme checking with graphics, simulation of the machining:
  (a) display of blank
  (b) views in three planes
  (c) plan view with depth display
  (d) 3D view
  (e) magnify.

The Mikron machines on La Silla and Garching have demonstrated excellent performance and this has enabled us to manufacture not only the Optopus but also to participate in the manufacture of "EMMI", the extraordinary instrument mechanically designed by H. Kotzlowski and described by S. D'Odorico (see *The Messenger* No. 61, September 1990) and with which R. Buettinghaus and myself have been working for almost one and a half years in the Garching Mechanical Workshop.

As the dawn of the VLT approaches, we are well equipped to deal with the instrumentation of tomorrow.

News About Adaptive Optics

After the successful initial test of the adaptive optics prototype system on the 3.6-m telescope (see *The Messenger* No. 60), a second test run was performed from September 26 to October 2, 1990. The aim of this run was to test two improved Shack-Hartmann wavefront sensor configurations, a sensor for the visible wavelength range, equipped with an electron bombarded CCD (EB-CCD), and an infrared wavefront sensor.

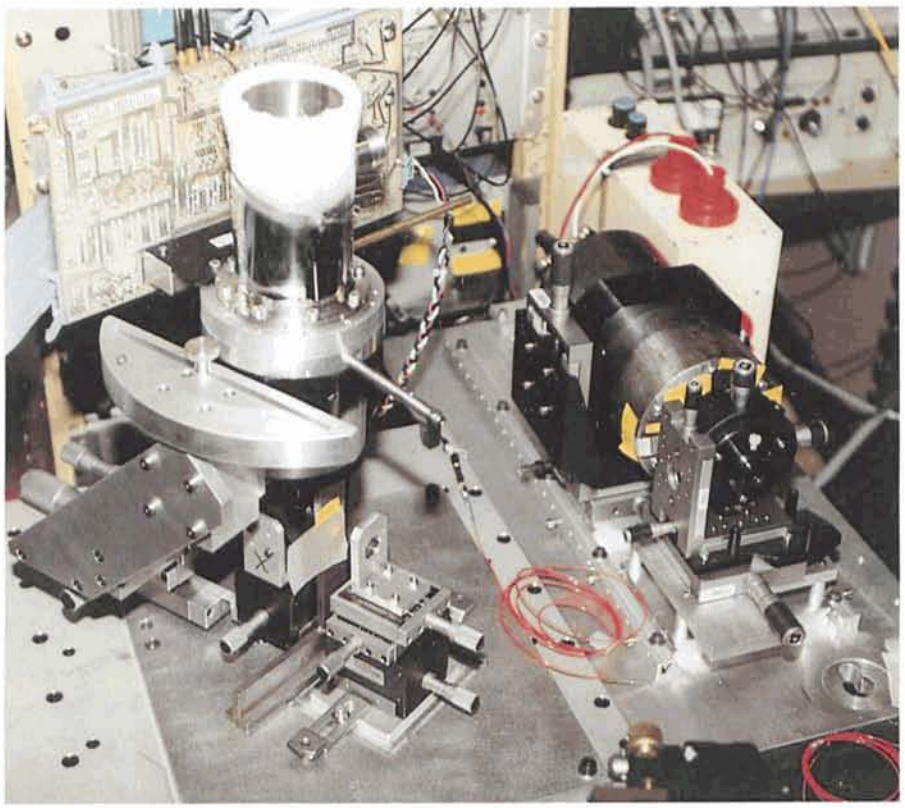
The EB-CCD sensor was developed by the Observatoire de Paris. The EB-CCD, which is still in a prototype phase, was manufactured by LEP (Philips) in France and allowed to push the limiting magnitude for wavefront sensing in the visible to approximately m_v = 11.5, a substantial gain compared to the old sensor which was based on an intensified Reticon and only reached m_v = 8.5. The new sensor appears to be quantum noise limited.

In a second test an infrared wavefront sensor was applied to the adaptive system. This sensor was built by the Observatoire de Paris and LETI-LIR in Grenoble, where the 64 by 64 InSb detector array has been developed with a readout noise of 450 electrons. Although the system transmission was not yet fully optimized, the servo system, locked on a star of m_K = 2.5, offers very good prospects for the future. For this sensor, the limiting magnitude still has to be determined, but it has already proven to be suitable in the closed-loop system.

The above-mentioned test run was aimed at purely technical features and fine-tuning of the prototype system. A science-devoted run with the adaptive optics system followed from October 24 to November 5. For the first time, 6 nights have been exclusively devoted to the scientific exploration of adaptive optics. The set-up and activation of the system has now become a nearly routine operation, and for the team of astronomers from Observatoire de Paris-Meudon it was possible to concentrate fully on the science aspects of their observations.

A second similar science-devoted run is planned for January 1991 before the system will undergo a major upgrade. In early 1992 it will be available again with a deformable mirror with approximately 50 actuators and an increased bandwidth of 25 Hz to possibly 40 Hz (at 0 dB). This will allow diffraction-limited observations at the 3.6-m telescope in the K-Band and possibly the H-band with good seeing. Although it will still be a prototype, we will attempt to make it more "user-friendly". It may then be offered to the ESO community in late 1992 for a limited number of programmes.

F. MERKLE, ESO
F. RIGAUT, Observatoire de Meudon



This picture shows improved Shack-Hartmann wavefront sensors. They can be installed simultaneously on the prototype system optical bench. The EB-CCD based sensor is shown on the right side with the lens array mounted in the alignment stage in front of the cylindrical detector housing. The infrared sensor with its small cryostat is shown on the left. Here the light enters from below via a relay lens and a folding mirror.

MIDAS Memo

ESO Image Processing Group

1. Application Developments – Graphics

The MIDAS graphics package has been subject to a number of questions during the course of this year. Although in principle one can obtain all important information from the MIDAS User Guide (Volume A, Chapter 6), we would like to summarize here briefly the available functionality.

The MIDAS graphics sub-system enables you to visualize (plot) all data structures in MIDAS: frames, tables, descriptors and keywords. To do so, obviously named plot and overplot commands have been implemented. In general these commands have a well defined syntax.

To retrieve e.g. pixel intensities or coordinates from plotted data or to examine spectral features the user can run the general GET/GCURSOR command. The graphics cursor is also used in several other applications like flux determination, computing the centre of spectral lines, line identifications, etc.

The graphics system uses default settings which in most cases make sense. These plot settings include: axes labelling and format, line width and type, symbol size and type and many others. All these setting parameters are stored in the MIDAS system and can be inspected and changed using the command SHOW/PLOT and SET/PLOT, respectively. The user can also specify how nice the graphics output should look. This layout is determined by the SET/PLOT parameter PMODE. It can vary between rather simple (PMODE = 0 or 1) or more elaborate to produce a high quality (PMODE = 3).

The graphics system is primarily designed for off-line data reduction. However, a number of general purpose commands for drawing axes, lines, symbols and text, combined with the PMODE = 3 setting, make the system very suitable for the production of publication quality plots. On this page, as an example, you see two versions of the same plot produced with PMODE = 1 and PMODE = 3.

Graphics output can be assigned and sent to all display and hardcopy devices. With the command ASSIGN/PLOT the user can determine the output device in advance. The command SEND/PLOT sends the graphics output file (if created) to any of the supported graphics devices. A list of all graphics devices supported can be found in the MIDAS User Guide. Of particular interest is the possibility of producing MIDAS graphics on PostScript printers. Besides the increase in quality the postscript graphics file can also be combined with other postscript documents. This offers the possibility of full integration of the MIDAS graphics output into postscript documents typeset by e.g. TEX or LATEX.

Like all systems, MIDAS is not perfect. Regularly new features and commands are implemented. In order to stay up to date about MIDAS it is useful to read the MIDAS NEWS frequently (also experienced users) and to have a glance at every newly issued MIDAS manual. But this is obvious . . ., we hope.

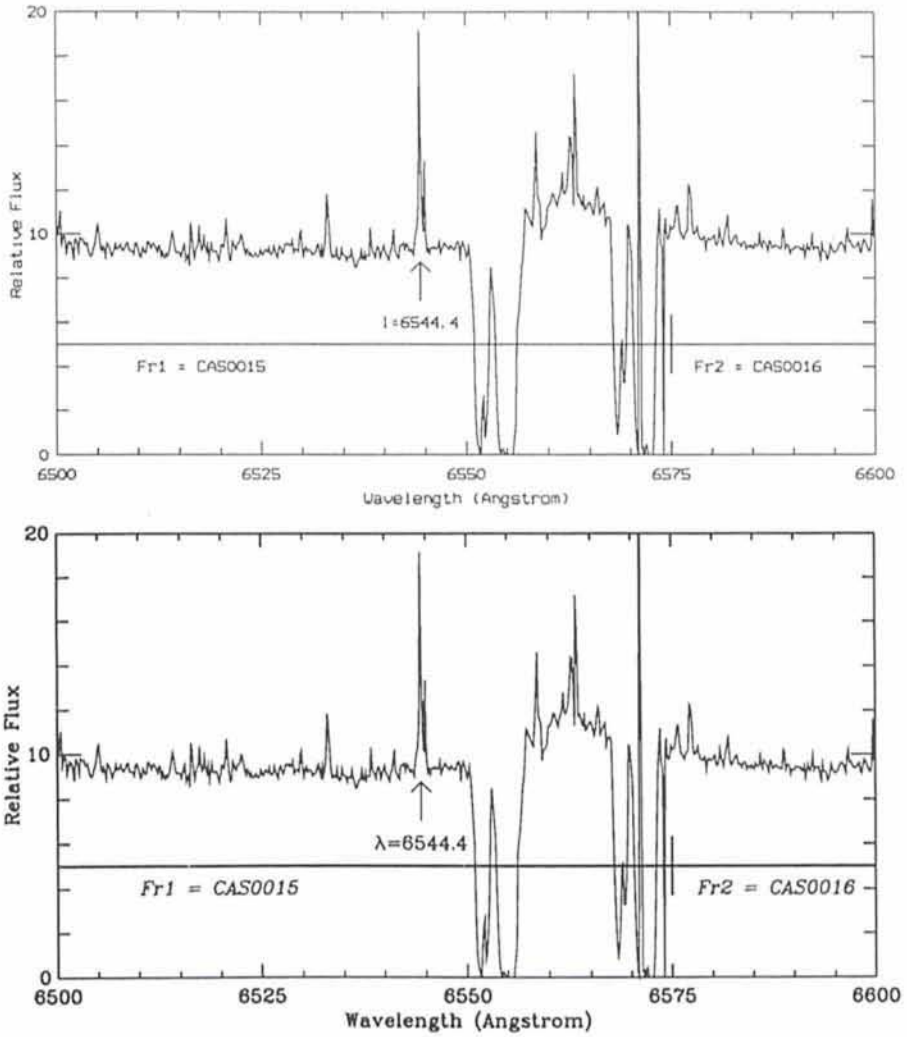
2. Archiving

Systematic Archiving of NTT data will start from the beginning of Period 46. This means that NTT data will be available directly from Garching, to the observing team only during the proprietary period of one year, and to other astronomers after this period. The delay for availability at Garching will normally not exceed three weeks after observation.

The summary of each observation will be stored in the Archive Catalogue as soon as possible after the observation, normally during the day or at least during the week following the observation. It will be possible to query the Archive Catalogue directly from La Silla, using the Starcat programme installed on a Sun workstation. It is expected that the observer will check the contents of this catalogue during his observation run, and report the anomalies and errors he detected to the *archeso* account at La Silla or at Garching. Note that Starcat can also be used from La Silla to get information about many other astronomical catalogues, including 25 million stars in the Guide Star Catalogue.

3. Personnel

The Image Processing Group deeply regrets to announce that Susan Winter (Lively) has left us for the south of France due to personal reasons. Susan has been handling the MIDAS documentation and distribution ensuring that everything ran smoothly. Her knowledge of TEX and LATEX made it possible for us to maintain nice looking manuals written in good English. She not only took care of the manuals, but also of the technical editing of the Proceedings of the Data Analysis Workshops. We will miss Susan not only for her technical skills but also as a good colleague and we wish her all the best.



4. MIDAS Hot-Line Service

The following MIDAS support services can be used to obtain help quickly when problems arise:

- EARN: MIDAS@DGAESO51
- SPAN: ESO::MIDAS
- FAX.: +49-89-3202362, attn.: MIDAS HOT-LINE
- Tlx.: 528 282 22 eso d, attn.: MIDAS HOT-LINE
- Tel.: +49-89-32006-456

Users are also invited to send us any suggestions or comments. Although we do provide a telephone service we ask users to use it only in urgent cases. To make it easier for us to process the requests properly we ask you, when possible, to submit requests in written form through either electronic networks, telefax or telex.