

interface allows observers to define a sequence of exposures with each exposure having its own filter/grism/slit combination. In addition, it is possible to define a sequence of sequences. By combining the various controls into one package, DAISY both optimises and simplifies observations.

Focus Pyramid

During Danish time at the beginning of January, a new focusing device was tested and installed in DFOSC by Per Kjaergaard Rasmussen and Michael Andersen from Copenhagen University Observatory. The prism works in the same manner as focus wedges, which have been in use in the focal reducers at La Silla for many years. However, instead of splitting the telescope pupil into two images, as is done with a wedge, the focus pyramid splits it into four components. The advantage is that alignment is not critical for the resulting focus estimate, which makes it simpler to maintain.

A new observing batch has been developed for analysing the images and

it is now possible to check the focus in less than a minute. This will enable a much more frequent refocusing of the telescope than has previously been feasible and thus help to improve the image quality.

Image Quality Improvements

Following the promising results which have been achieved at the 3.6-m telescope (see e.g. S. Guisard, *The Messenger* 86, p. 21), an investigation of the image quality of the Danish 1.54-m is also in progress in close collaboration with the group at Copenhagen University Observatory. It is clearly a complex problem and we must proceed one step at a time to achieve consistent results. The first step is to improve the monitoring of the current performance and ambient conditions to determine which are the major sources of the seeing. Apart from the atmospheric seeing there are probably significant contributions to the seeing from the dome, the telescope itself as well as from the finite size of the pixels of the detector.

The physical size of the pixels corresponds to 0.39 arcsec on the sky, but as the overthinned LORAL-CCD smears the charge, the effective pixel size is significantly larger, especially in the blue. Still, images with a seeing of 0.9 arcsec have been obtained with DFOSC so the potential for sub-arc-second images is definitely there.

To investigate the effect of mirror seeing, the mirror cover has been lifted some 10 cm at the beginning of January and a couple of fans have been mounted following the example of the 3.6-m. The first tests suggest that the forced mirror ventilation reduces the typical FWHM of images by 0.2–0.3 arcsec. More tests under a wider range of external conditions will have to be carried out to derive a clearer picture.

The next step will be to assess the amount of dome seeing and the ways in which this contribution can be reduced.

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END OF LA SILLA NEWS PAGE

New CASPEC Manual and Simulator

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1. CASPEC Operating Manual

A new operating manual for the Cassegrain Echelle Spectrograph (CASPEC) at the 3.6-m telescope is now available.

The manual can be retrieved from the 3.6-m & CAT WWW page:

(<http://www.ls.eso.org/lasilla/Telescopes/360cat/html/CASPEC/caspec.html>).

Since 1989, when the last operating manual was written (ESO Operating Manual #2), CASPEC has undergone several modifications; the main ones being: the installation of two new (RED and BLUE) cross-dispersers; CCD upgrades; a new clamping system, which reduced the flexure in the spectrograph; and the addition of new colour filters to the CASPEC set. An update to the manual was written in 1993 by L. Pasquini. The major changes since then are the installation of a new high-efficiency CCD (ESO CCD #37) and the fact that only one grating (31.6 lines/mm) and only the Long Camera are presently offered.

The new manual describes CASPEC in its present status. This includes all the information reported in separate documents since 1989 (e.g., new cross-disperser efficiencies, 3.6 + CASPEC + CCD #37 overall efficiency, CCD #37 characteristics), plus new information; in particular, the inter-order separations for the 31.6 lines/mm

echelle grating and the long camera for both the RED and BLUE cross-dispersers. Additionally, S/N estimates are given for the two standard configurations (31.6 lines/mm echelle + RED (BLUE) cross-disperser + Long Camera + CCD #37); new bright, 1.6 nm resolution flux standard stars have been added to the table of standards stars; reference exposure times for Quartz and Thorium-Argon lamps exposures with the different neutral density filters and colour filters are given; and, finally, a new Long Slit filter centred at 671.1 nm, which arrived very recently, have been added to the list of Long Slit filters.

The structure of the manual differs with the 1989 version. For example, a more comprehensive introductory chapter is given. It summarises the properties of CASPEC and compares it with the two other high-resolution spectrographs at La Silla, namely EMMI at the NTT and the CES at the 1.4-m CAT telescope. In this chapter, the CASPEC observing modes are listed and all the basic characteristics of the instrument are summarised. This first chapter should be read before writing the Observing Proposal; in particular, it should allow the observer to discern whether CASPEC is suitable or not for your scientific programme. Chapter 2 describes, in detail, the characteristics of the different components, and should allow one to choose the most suitable configuration for a given project. Chap-

ter 3 (Instrument performance) should also be read when writing the proposal in order to ascertain the feasibility of the project and to estimate the number of nights needed to carry out the project. This Chapter is complemented by a simulator (see below). Finally, Chapters 4 and 5, may be skipped when preparing the proposal, but should be read before carrying out the observations.

CASPEC Exposure Time Calculator

The ESO 3.6-m CASPEC Exposure Time Calculator (Version 1.0) has been completed and is available on the 3.6-m Team CASPEC Homepage.

The calculator can simulate the most common observing set-ups for CASPEC; future versions may include Long Slit mode and the Zeeman Analyzer. It is based on both observed and theoretical parameters. The simulator will be used as a starting point for the CASPEC Physical Model.

This calculator takes into account many observing parameters not included in other simulators or S/N estimators (e.g. Chapter 3 of the CASPEC manual). For example, the phase of the moon, seeing slit losses, airmass corrections and basic colour terms in the assumed input magnitude are included. The calculator can either be used to estimate the S/N in the resulting spectra for a given exposure time or to

ESO 3,6m CASPEC Exposure Time Calculator
Version 1.0

The calculator can compute the S/N For a given exposure time or the exposure time for a given S/N.
Click on button to change device setting, on device name for HELP.

Input Spectrum

Spectra will be scaled to the following broad band magnitude:

Magnitude: in Bandpass: with Effective Temp (K):
 Flux (10^{-19} ergs/cm²/s/Å):

Atmosphere

Sky Brightness: Moon Phase Magnitude (mag/arcsec²):
 Airmass:
 Seeing (arcsec):

Optical Path

Echelle Grating:
 Folding Flat & XD:
 Filter:
 Slit: Height (arcsec) Width (arcsec)
 Detector: Read Mode: slow fast
 Binning (pixels) X: Y:

Observations

Wavelength (Angstroms):

Please choose to enter either the Exposure Time OR the Desired S/N.

Exposure Time (sec):
 Desired S/N:

Figure 1: Exposure Time Calculator.

estimate the required exposure to obtain a spectrum with the given S/N.

For example, input parameters might include: a 15th V-magnitude star with an effective temperature of 5000K. The observations are to be taken during bright time at 1.5 airmasses and with 1.0 arcsec seeing. The wavelength of interest is 6000 Å employing the Red cross-disperser and a 1.2 arcsec slit (see Fig. 1).

With these input parameters S/N of 15 per pixel (in the summed spectra) can be achieved in an exposure of approximately 2600 seconds.

The simulator can be used to plan an observing run but should not be substituted for actual observing!

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algorithms to most standard software packages. The result had to work simultaneously under most other data-processing software packages, and modifications should be easy to quickly add new methods as they come out of the Working Group.

The decision was taken to develop in ANSI C, which acts as a *lingua franca* for Unix-based workstations. The set of supported machines is: any machine running a Unix Operating System. In this way, we ensure portability, code reusability, and integration into all major data-reduction software packages.

Overview

eclipse offers an open environment for data-reduction algorithm development and simple pipeline processings. At the highest level, the user will find a manual describing how to observe and calibrate data using Adonis in its different modes, with associated example reduction scripts ready to be called from within standard software or directly from the Unix command line. So far, covered reduction aspects are:

- pixel gain map creation
- dead pixel detection and correction
- simple data classification from FITS information
- sky-subtraction and flat-field division
- shift-and-add
- data extraction and merging
- statistics computation
- cube arithmetic
- spatial filtering
- Fourier transform
- image resampling

All of these high-level procedures are running without user interaction, which is typical of a pipeline, number-crunching approach.

The Eclipse Software

N. DEVILLARD, ESO

A Brief History

Adonis, the Adaptive Optics instrument on use on the 3.6-m telescope on La Silla, is available for the astronomical community since April 1993. Experience has been acquired by many users since then, and what Adonis needed most was to gather this experience, and then offer a set of data-reduction facilities and guidelines for observation and calibration procedures. To get all the expertise, a working group was created, dealing with High-Resolution Infra-Red Data Reduction. Its output was directly fed into

software development to produce the *eclipse* software.

When we took the decision to develop *eclipse*, we had to set up how far it should go when reducing the data, and which language/platform should be host. By questioning Adonis users, we found out that writing the Data Reduction Software within a standard reduction package such as MIDAS, IRAF, or IDL, would certainly reduce the number of potential users. Furthermore, high-resolution data reduction techniques are constantly evolving, and it is not always easy or even possible to add up brand new