A600 is at present dedicated to the control of the AOS spectrometers. Instruments and sensors are interfaced to the computers via the industry standard bus systems GPIB and CAMAC.

Two popular on-line data reduction packages designed for radio astronomy are supported. These are POPS (People Oriented Parsing Service), a system developed in the USA, and Toolbox, a system developed in Germany. Users may also write their data to tape using the well-known FITS format for reduction by other popular off-line systems.

Proposals for SEST Observations

Routine observations using SEST will be allocated on a six-month basis, in accordance with the standard ESO observing schedule. They are expected to commence with period 41, starting 1 April 1988, for which the proposal deadline is 15 October 1987.

In the meantime, there will be opportunities for limited observations using the first receiver (85–117 GHz) and AOS (50 kHz resolution) starting in August or September, during the testing and calibration phase. These opportunities are necessarily restricted to astronomers with considerable experience in millimetre wave observations, who are willing to work with an evolving system and contribute to its development. Proposals for this period should be submitted as soon as possible to the Visiting Astronomers Office in Garching.

Operations

The operation of SEST on La Silla is in the hands of a team comprising:
Scientist in Charge:
Lars E.B. Johansson
Microwave Engineers:
Magne Hagstrom, Nick Whyborn;
Software Scientists:
David Murphy, Michael Olberg

This dedicated group has been heavily involved with receiver and software development for more than a year. Two further persons will soon be added to this team.

Following its completion under the supervision of Dietmar Plathner, the new telescope was handed over to the team at La Silla on March 13, 1987 and "first light" was obtained on March 24. Commissioning is now under way, and series of tests designed to determine the pointing and homology characteristics and the receiver performance, and to streamline the control system, are in progress. When these are complete, experienced millimetre astronomers will be invited to try out the system. SEST should become generally available in early 1988 after the 230 GHz receiver has been commissioned. Proposals will be accepted for the ESO October deadline. Sweden and ESO will handle their respective proposals through separate programme committees and time will be allocated to the two parties on a 50–50 basis.

Scientific Programme

The scientific programme for SEST depends, of course, on the interests of the user community. A full discussion of the potential programmes for the telescope took place during the Aspenäs workshop (ESO Conference and Workshop Proceedings No. 22, 1985). While the millimetre and submillimetre spectral region is usually considered the province of molecular line astronomy and cosmochemistry, we saw a great deal of interest in continuum studies both of interstellar dust, active galactic nuclei and quasars, and the cosmic background radiation since the Sunyaev-Zeldovich decrement changes sign between 2 mm and 800 microns wavelength.

In the field of molecular spectroscopy the southern sky has great potential because the southern Milky Way contains a plethora of important dark clouds and H II regions, many with unusual features. Probably one of the most important although poorly understood discoveries of molecular line astronomy is the fact that so many protostars in the Galaxy go through the stage of bipolar outflow. The southern sky is rich in optical signposts of bipolar flows, such as Herbig-Haro objects, and this points to a feast of new observational data. Their observations in the new wavelength range and with the higher resolution provided by SEST should help us understand this unexpected phenomenon.

At the other end of the evolutionary scale, the study of mass loss from evolved stars, Mira variables and red giants is an exciting prospect, particularly in view of the host of IRAS objects now waiting to be observed at millimetre wavelengths. One of the first observations with SEST provided the detection of a new 86 GHz SiO maser in a Mira variable, R Doradus (Figure 3).

In the past few years we have seen much interesting work on the carbon monoxide distribution and molecular cloud dynamics in nearby galaxies. Again IRAS has been an inspiration and we now find that extragalactic CO is detectable in galaxies with recessional velocities greater than 8,000 km s^{-1}. The southern sky is rich in active galaxies and their observation will enhance the statistical data base needed to relate star formation rates to molecular emission, IR and continuum radio fluxes.

Finally, solar system objects will not be neglected with SEST. In fact, it may be possible to observe comet Wilson already next month. Observations of planetary atmospheres and the continuum emission from planets and asteroids at submillimetre wavelengths will be of great interest.

We look forward to these exciting discoveries, which have been made possible by the dedicated efforts of the many people involved.

List of ESO Preprints

491. B. Barbanis: Irregular Periodic Orbits. *Celestial Mechanics.* March 1987.
492. L. Milano, M. Rigutti, G. Russo and A. Vittone: Some Observed Peculiarities of the Triple System V 701 Cen. *Astronomy and Astrophysics.* April 1987.
493. S. Cristiani: Observation of the H II Galaxy Giving Origin to the Z = 0.3930 Absorption System of the QSO 1209+107. *Astronomy and Astrophysics Letters.* March 1987.
494. L. Koch-Miramond and M. Aurière: X-Ray and UV Observations of Omega Centauri with EXOSAT. *Astronomy and Astrophysics.* March 1987.
495. S. Cristiani et al.: Radial Velocities of Galaxies in the Cluster Klemola 22 from Observations with Optopus, the ESO Multiple Object Spectroscopic Facility. *Astronomy and Astrophysics.* April 1987.
496. E. Giraud: Malmquist Bias in the Determination of the Distance to the Hercules Supercluster. *Astronomy and Astrophysics.* April 1987.
497. G. Garay: The Orion Radio Zoo: Pigs, Deers and Foxes. Invited talk given at the V. I.A.U. Regional Latin-American Meeting, Merido, Mexico (October 6–10, 1986). April 1987.
498. B. Binggeli, G.A. Tammann and A. Sandage: Studies of the Virgo Cluster. VI. Morphological and Kinematical Structure of the Virgo Cluster. *Astronomical Journal.* April 1987.
499. T. Le Bertre: Optical and Infrared Observations of Two Type-II OH/IR Sources. *Astronomy and Astrophysics.* April 1987.
500. Supernova 1987 A in the LMC. Astrometry (R.M. West et al.), Photometry (S. Cristiani et al.), Polarimetry (H.E.

Schwarz and R. Mundt), Infrared Observations (P. Bouchet et al.), Medium and High-resolution Spectroscopy (I.J. Danziger et al.; A. Vidal-Madjar et al.) *Astronomy and Astrophysics,* Letters. March 1987.

501. H. Dekker and B. Delabre: Simple, Wide-Band Atmospheric Dispersion Corrector. *Applied Optics.* May 1987.
502. L. Milano, G. Russo and A. Terzan: FS Lup: A Contact Binary in Poor Thermal Contact. *Astronomy and Astrophysics.* May 1987.
503. L. Binette, A. Robinson and T.J.-L. Courvoisier: The Ionizing Continua of Active Galactic Nuclei: Are Power Laws Really Necessary? *Astronomy and Astrophysics.* May 1987.
504. L. Binette, T.J.-L. Courvoisier and A. Robinson: Constraints on the Soft X-Ray Continuum of AGN Derived from Photoionization Models. *Astronomy and Astrophysics.* May 1987.
505. T.J.-L. Courvoisier and M. Camenzind: Magnetic Field and Synchronization in Mildly Relativistic Shocks. *Astronomy and Astrophysics.* May 1987.

High Speed Multicolour Photometry of the X-ray Burster MXB 1636-53

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H. PEDERSEN, ESO

1. Introduction

X-ray burst sources are thought to be low-mass binary systems in which a mass-losing late-type main-sequence star transfers matter via an accretion disk onto a neutron star. The high potential energy of the material is converted to high kinetic energy, which subsequently thermalizes and escapes as X-rays. Depending on the temperature, the strength of the magnetic field and the accretion rate of the neutron star, a thermonuclear flash can occur on its surface from time to time. Within seconds a total energy of about 10^{39} erg is released. The resulting radiation is predominantly in the X-ray band. Burst intervals are mostly irregular and range from hours to days. There is no clear relation between the shape of the burst, the intervals and the continuously emitted X-ray level. Black-body fits to the energy distribution of the bursts yield temperatures up to 10^7 K and a radius of the emitting area of approximately 10 km thus supporting the neutron star model.

Optical bursts correlated with X-ray bursts have been observed for several sources. The shape of an optical burst is similar to that recorded in the X-ray range, whereas its energy content is a fraction of 10^{-4} only. Nevertheless, this is more than expected from an extrapolation of the X-ray spectrum. Usually the optical burst is delayed by a few seconds. This can be understood as a consequence of the longer light path from the X-ray source via the place of reprocessing to the observer, compared to the path on the direct way.

MXB 1636-53 (optical counterpart: V 801 Ara) is one of the best studied examples in both the X-ray domain and the optical region. Several coincident X-ray/optical bursts were recorded and

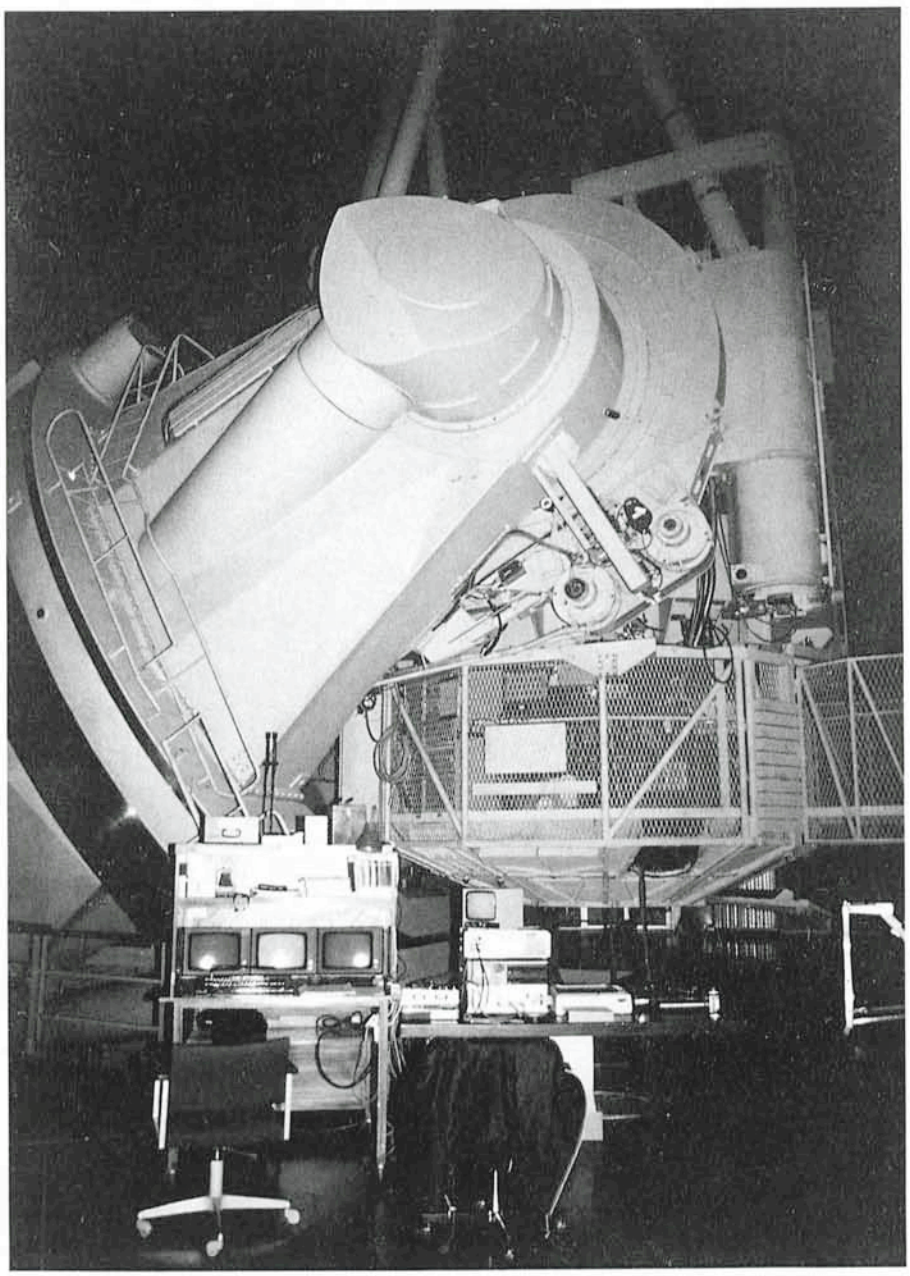

Figure 1: *The data-acquisition system of the photometer placed inside the dome of the 3.6-m telescope during observations.*