

# First run of the F.T.S. at the Coude Focus

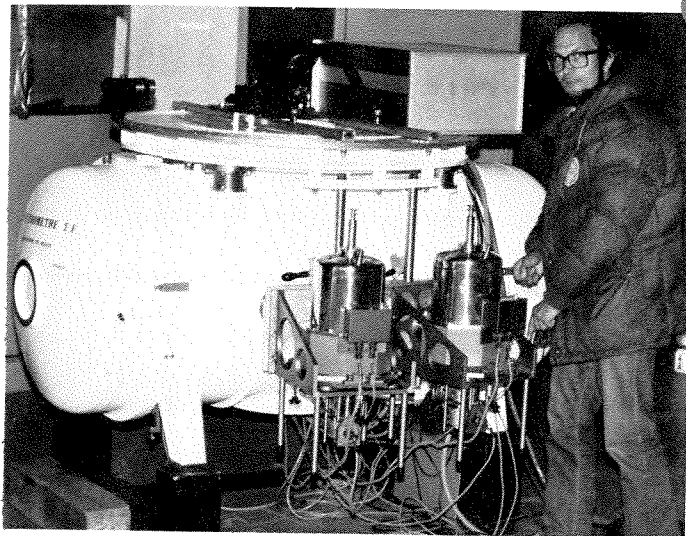
The first test of the Fourier Transform Spectrometer (F.T.S.) built at Meudon Observatory and moved here last June, took place at the coudé focus on the nights of May 9 and 10, followed ten days later by a run of five nights.

The F.T.S. is designed to work at the infrared Cassegrain focus, but as this focus is not yet available, the coudé focus had to be used for testing. The optical efficiency certainly is not optimum with 8 mirrors ahead of the entrance aperture of the instrument. With this temporary configuration the field of view is very limited. Only one aperture of the interferometer has an unvignetted view of the sky, so background subtraction is not possible.

The purpose of the test was to check that everything still worked properly, as at the last tests at O.H.P. one year before. Earlier this year some unexpected problems had occurred. The most serious was arcing in the reference laser, caused by the low air pressure at the summit. This resulted in damage to the high voltage power supply and the laser head itself. Also, a dewar had to be completely dismantled to repair a leak at a delicate solder joint.

Guy Michel, electronics engineer at Meudon Observatory, came to Hawaii for the tests. Guy was in charge of building the electronics of the system. The day before the instrument was aligned with the telescope, the interferometer was servo-controlled, under the control of the computer through the CAMAC modules. Everything was working, to the surprise of many!

The astronomical tests started on various objects (Jupiter, Saturn, Uranus and some Mira stars) in the 1 to 2.5 micron window. The background at 5 microns was found too high to work properly in this spectral range. It is too early to give an estimate on the sensitivity of the system as the interferograms recorded in these tests have to be transformed. To do this some programs have to be implemented on the computer at Waimea.



*Jean-Pierre Maillard checks the dewars on the Fourier Transform Spectrometer during an engineering run. A mirror at the top of the spectrometer tank directs light to the instrument from the coudé camera.*

At present we are working on three improvements:

1. The level of thermal background at 5 microns must be reduced. The optical matching of the dewars needs some changes.
2. The immunity of the electronics to radio frequency interference has to be improved, despite the great care that has already been taken.
3. The part of software which generates a quick look of a small portion of the spectrum in real time has to be corrected. Some bugs in the program remain.

What do we expect in future? The problems mentioned above have to be fixed before the next run scheduled in October, again at the coudé focus. Then the installation of the F.T.S. in its final configuration (at the infrared Cassegrain focus) will take place during the first semester of 1982.

## Observations with the Coude Spectrograph

All coudé observers this past semester, we are happy to report, obtained at least some useful data. Most groups had perfect weather, and generally found the equipment worked well. Of the ten groups using the coudé spectrograph, nine used it with the Reticon detector.

Substantial improvements have been made to the coudé exposure meter in the past

semester. A new red sensitive (extended S-20) photomultiplier tube was installed. This makes it possible to guide with the exposure meter in the red and near-infrared (as well as the blue), to prevent light loss through atmospheric dispersion. New pulse counting electronics have also been installed, which enable guiding on considerably fainter stars than previously.