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HIGH RESOLUTION SPECTROSCOPY OF SOUTHERN SEYFERT GALAXIES

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We started a spectroscopic program on southern Seyfert galaxies in 1974, in order to obtain high resolution profiles of some emission lines in a statistically significative number of active nuclei. The goal has been to correlate profile parameters with other observed properties of the objects, and infer the physical and kinematical conditions of the emitting regions.

The instrumentation used was the coudé spectrograph of the 1.6m telescope of the Observatório Astrofísico Brasileiro, with a photon counting reticon detector (described by Lathan, 1982, IAU Colloquium 67). The main characteristics of the system are :

Reciprocal dispersion : 18 $\mathring{A}\ mm^{-1}$
Resolution : 0.7 $\mathring{A}$ (~ 35km s^{-1} at Hα)
Spectral coverage : 450 $\mathring{A}$
Slit : 1"2 x 5"

Two exposures were taken of each object, centered at Hβ/OIII and Hα. Because of the good mechanical stability of the system, long exposures are possible. On a typical 2-hour integration, we obtained a signal to noise ratio of 10 on the continuum and 30 on a bright line, for an object of m_V ~ 14.5 - 15.0.

Until now we have obtained spectra for the following objects : PKS 2048-57, F9, F51, MCG-6-30-15, ESO 141-G55, NGC 6814, NGC 7213 and the quasar 3C273. A preliminary analysis shows that :

1. The OIII 4959-5007 forbidden lines of PKS 2048-57 can be decomposed in 3 components. The two broadest ones show an intensity ratio OIII/Hα of 2.5, typical of Seyferts, while the narrowest one has the ratio of 0.45, typical of a Liner or HII region.

2. All objects showed the typical blue asymmetry in the forbidden lines. The data suggest that this asymmetry can be interpreted as due to a broad independent component, blue shifted relatively to the main, narrower line component.

3. There is indication of variability of the broad component of Hα in NGC 7213.

4. We did not find a good correlation between the asymmetry index AI_{20} of Heckman et. al. (Ap.J. 247, 403, 1981) and Balmer decrement. This indicates possible problems with Heckman's interpretation of profile asymmetry being due to dust in the emitting regions.

We report also the first detection of the OIII 5007 line in NGC 7213. The profile is highly asymmetry being due clearly to two components. The broadest one has a FWHM of 1250 km s^{-1}, and the centers of the two components have a separation of about 470 km s^{-1}.

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