

## An Optical Study of a Sample of Active Galaxies

C. Surace, G. Comte

*Observatoire de Marseille, 2, place Le Verrier 13248 Marseille*

J. Guibert, O. Moreau (Liege)

*I.A.P., 98 Bd Arago, 75014 Paris*

**Abstract.** A new sample of active galaxies was obtained with the ESO Schmidt telescope. We derived quantitative redshifts for 97 emission line galaxies and semi-quantitative photometric and spectro-photometric properties for 62 of them. The results are directly extracted from the Schmidt plates after digitization by the MAMA machine of Observatoire de Paris (C.A.I, INSU Paris).

### 1. Introduction

In spite of numerous recent studies many questions on starburst galaxies still remain unanswered, such as the luminosity function of faint galaxies, the metal abundance distribution, burst triggering mechanisms and so on. Until now two-colour surveys and emission line searches have not sampled the same galaxy populations. So we conducted a new survey of active galaxies in the Virgo supercluster southern extension ( $13^h, -25^\circ$ ), using the ESO 1 m Schmidt telescope (La Silla). So far, 50 square degrees (out of 300 square degrees) have been reduced. We built a sample of UV excess and/or emission line galaxies using the Schmidt telescope with and without an objective prism. Dedicated reduction procedures allow us maximum astrophysical output before any follow up with 2m class telescopes. In a recent paper we described these procedures, calibrations and the very first results obtained using high quality microdensitometer digitization of the plates (Surace & Comte 1994).

### 2. Results

#### 2.1. Photometry

We have measured blue and red apparent magnitudes for 84 emission line galaxies, deriving a limiting magnitude  $R = 19.5$  with completeness to about  $R = 17.5$ , consistent with the results obtained by Wasilewski (1983) and Salzer (1989). The  $U-R$  colour distribution of the emission line galaxies shows that starburst galaxies are dominated in the visible range by A0 to F5 main sequence stars. Studying the effective diameter distribution of the sample, we show that the sampled population is rich in galaxies of small diameter ( $< 3$  kpc). This could

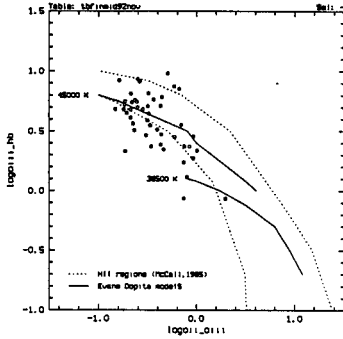
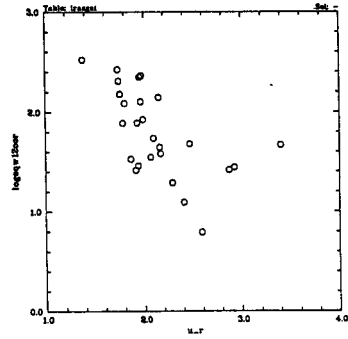


Figure 1. Excitation diagram

Figure 2. EQW [OIII] vs  $U-R$ 

be due to the easier propagation of starbursts in systems of small dimension, resulting in easier detections.

## 2.2. Redshifts

We derived redshifts for 97 emission line galaxies and analysed the 3-D distribution in comparison with a sample of “normal” galaxies extracted from Dressler’s catalog (1991) on the same sky area. Active galaxies are distributed on the same structures as normal galaxies (Salzer 1989). We did not find any active galaxies in the bubbles defined by the Dressler galaxies.

## 2.3. Equivalent width (EQW) and line ratios

Using IIIaJ plates only [OIII] $\lambda\lambda 5068, 4959$ ,  $H\beta$  and [OII] $\lambda\lambda 3727, 3729$  can be seen. The distribution of [OIII] equivalent width looks similar to the distribution obtained by Salzer (1989) for the *UM* sample. The excitation diagram shows that most of our galaxies can be classified as starburst galaxies (Fig. 1). We also find a good relationship between  $U-R$  colour and EQW [OIII] in all our galaxies implying the non-existence of a cut-off in the stellar initial mass function of our sample (Fig. 2).

## 3. Conclusions

We emphasize that these results are directly extracted from the Schmidt plates, after digitization, and without any CCD observations. This is the first time that so much astrophysical information has been extracted from photographic plates in a survey of active galaxies.

## References

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