PHYSICAL CONDITIONS OF H II REGIONS IN M33

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We present spectrophotometry in the 3400-7400 A range for seven H II regions in M33. We have determined the physical conditions for these regions. In three cases we have derived the electron temperature from the I(5007)/I(4363) ratio.

We find chemical abundances and compare them with results by other authors. The O/H abundances determined from H II region models and the nebular lines are significantly higher than those derived from a direct determination of the electron temperature and the assumption that it is constant over the observed volume. We discuss the possibility that most of the difference could be due to variations of the temperature over the observed volume; in some cases these variations are accentuated by the presence of stellar winds and SNR embedded in the observed volumes. Part of the scatter of the O/H derived values at a given galactocentric distance could be due to this effect.

We find O/H and N/O radial gradients; we do not find Ne/O, S/O nor Ar/O gradients.

PHYSICAL CONDITIONS OF H II REGIONS IN M51, NGC 3344, AND NGC 4321

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We present spectrophotometry in the 3400-7400 A range for seven H II regions in M51, three in NGC 3344 and three in NGC 4321. We have determined the physical conditions of each region using temperature calibration models.

The H II regions of M51 are extremely oxygen rich. The relatively low equivalent width of the emission lines and the very low electron temperatures, prevented us from determining directly T_e. From ionization structure models by other authors we we determined the chemical abundances, in particular we derive O/H, N/O and N/S gradients.

We have determined the radial gradients of O/H, N/O and S/O. We compare our results with those by other authors.

ACTIVE GALACTIC NUCLEI AND THE STARBURST PHENOMENON

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In an attempt to distinguish between starburst, disk, and non-thermal contribution to the far IR emission of Seyfert-Galaxies, we made a statistical study of the optical and far-IR properties of all the Seyfert 2 and Starburst Nuclei galaxies in the catalog by Véron-Cetty and Véron (1987, *A Catalog of Quasars and Active Nuclei*, ESO Scientific Reprint). We also used, for comparison, samples of Seyfert 1 liners and "normal"spiral galaxies.

We found a strong correlation between the luminosity at 25μm and the nuclear Hβ luminosity. We also found that Starburst Nuclei and Seyfert galaxies are similar in the sense that the model of transient heating of small dust grains in the galactic disk (e.g., Draine and Anderson 1985, *Ap. J.*, **292**, 494) cannot, even marginally, explain the observed emission at 25μm. These results are extensively discussed in Dultzin- Hacyan, Moles and Masegosa (1988, *Astr. and Ap.*, **206**, 95).

We report here the extension of this kind of statistical study to all the galaxies in the *Spectroscopic Catalog of H II Galaxies*, (Terlevich *et al.*, in preparation) that have measured Hβ fluxes and are detected at 25μm (as well as L_B for normalization). We found that the "excess parameter", I_{25}/I_{100}, (as defined in Dultzin-Hacyan *et al.*, 1988), is highly correlated with $L_{H\beta}/L_B$, but only weakly correlated with L_{100}/L_B or L_{60}/L_B (it is of course correlated with L_{25}/L_B).

This indicates that the bulk of the 25μm luminosity is of localized origin (associated to the H II regions); moreover, many have similar excesses to Starburst Nuclei and Seyfert galaxies. The 60 and 100μm luminosities on the other hand, are not such good tracers of star forming regions, since our results show that they have a more important disk contribution.

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