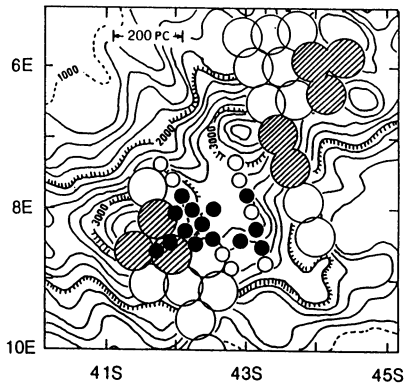

Fig. 3. CO observations in the super H I clouds P. The size of the circles shows the beam size. The large and small circles correspond to observations of Boulanger *et al.* (1984) with 100 pc resolution and of Ichikawa *et al.* (1985) and Nakano *et al.* (1986) with 47 pc resolution. Hatched and filled circles represent the regions where CO emission was detected.

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STAR FORMATION IN THE SPIRAL GALAXY M33

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The spiral galaxy M33 has been observed at several frequencies from the ultraviolet to the radio regions. The observations at 2030 A have been presented by Milliard (1984); the radio data obtained with the WSRT

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and the VLA are presented and analyzed in a series of papers (Viallefond and Goss 1986, and references therein).

The UV emission is distributed in a large scale exponential disc plus a number of sources all identified with associations of blue stars and/or optical H II regions. An important result has been to discover that a very large fraction ($\sim$ 75%) of the total emission of M33 at 2030 A is coming from this exponential disc. This disc has a scale length of $\sim$ 9.2 arcmin, i.e. only slightly larger than the scale length of the total far infrared disc as observed with IRAS (2^{nd} IRAS conference, June 1986) but significantly larger as compared to the 5.7 arcmin for the disc in the blue light. This suggests that the UV emission plays an important role in the heating of dust grains while the metallicity gradient varies on larger scale with a scale length of 14±2 arcmin.

At a resolution of about 30 arcsec 112 radio sources have been identified with Hα nebulosities; a significant fraction of these sources also coincide with the UV sources and associations of blue stars. Almost all optically identified supernovae remnants appear to be very weak in the radio region. The luminosity function of radio H II regions and the function of distribution of their optical diameters have been determined. Based on the identification rate of radio H II regions with blue star associations it is suggested that the regions are active in star formation for a duration of typically 7 to 11×10^6 yrs.

A detailed analysis of the optical extinction at Hα and Hβ suggests that the abundance of dust (by mass) is simply proportional to the abundance of oxygen.

The excitation gradient of H II regions with galactocentric distance can be interpreted by a variation of the upper end of the IMF with metallicity.

Finally, the properties of M33 H I-H II associations have been determined; the ratio of the number of Lyman continuum photons to the total H I mass is about 4×10^{44} phot. $M_\odot^{-1}$, i.e. similar to those determined for galactic H I-H II associations 100 times fainter or to those for the spiral M101 H I-H II associations which are 100 times more luminous. This important result illustrates the predominant role of the massive ionizing stars in the star formation efficiency at the scale of H I complexes.

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