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DIAGNOSTIC DIAGRAMS OF ELECTRON DENSITY VERSUS EXCITATION FOR PLANETARY NEBULAE

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Diagnostic diagrams of electron density-excitation for a sample of 613 Planetary Nebulae (PNe) are presented. New empirical limits for these diagrams are derived from the Hα/[N II] and Hα/[S II] ratios.

Electron density-excitation diagrams were introduced by Sabbadin, Minello, & Bianchini (1977). These diagrams compare the relative intensities from the Hα/[N II], [S II] $\lambda\lambda$6717/6731 and Hα/[S II] ratios observed in supernova remnants, PNe and H II regions. Originally the information used to define the zone of influence for the PNe was obtained from the Catalogue of relative emission lines intensities observed in planetary and diffuse nebulae by Kaler (1976), the available number of PNe in this catalogue is of only about 40 objects.

In order to update the areas of influence for PNe in these diagrams, we have now created a database with 613 objects from the Strasbourg Catalogue of Galactic Planetary Nebulae (Acker et al. 1992), with which we have constructed the new diagrams shown in Figures 1 to 3. This extended sample substantially expands on previous similar work.

Our database has allowed us to separate and analyze subsamples of particular interest, such as those with very low (Hα/[N II]) and (Hα/[S II]) ratios, that may indicate the presence of shocks from high velocity outflows. A full account of these results will be published shortly elsewhere.

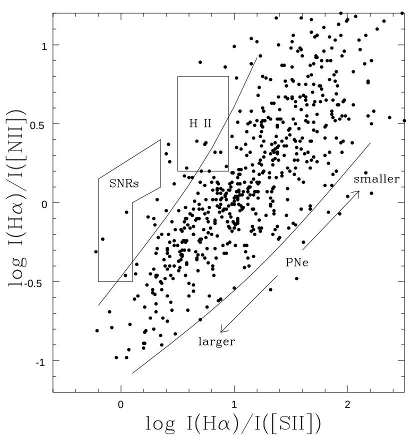

Fig. 1. Hα/[S II] intensity ratio versus Hα/[N II] ratio for PNe; the locations for H II regions and SNR from Sabbadin et al. (1977) are also indicated, as are the new empirical limits for this enlarged sample.

REFERENCES

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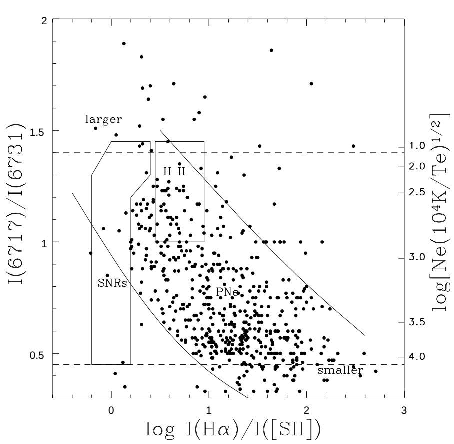

Fig. 2. As Fig. 1 but for Hα/[S II] vs. $\lambda\lambda$6717/6731.

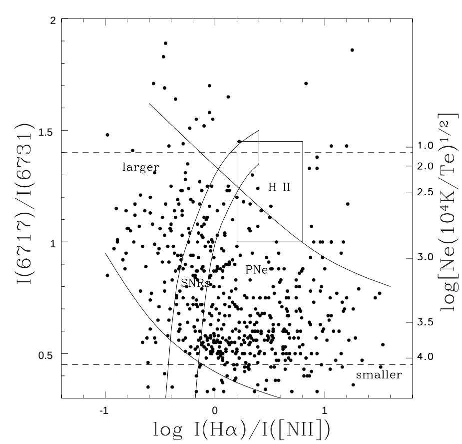

Fig. 3. As Fig. 1 but for Hα/[N II] vs. $\lambda\lambda$6717/6731.

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