

PROBABLE TYPE I PLANETARY NEBULAE

H. MORENO, A. GUTIERREZ-MORENO and G. CORTES

Departamento de Astronomía, Universidad de Chile, Casilla 36-D, Santiago, Chile

ABSTRACT: During a program of observations of planetary nebulae (PN) made at CTIO in 1982 using the 1.5 m telescope equipped with a Cassegrain spectrograph and a Vidicon detector, and repeated in 1991 using the same configuration with a CCD detector, we found four PN for which $H\alpha < [N II] \lambda 6583$: He2-109, He2-145, He2-152, and He2-163. The analysis of the data was made using the computing facilities of Cerro Tololo Computing Center at La Serena, and of the Centro de Procesamiento Digital de Imágenes of the Departamento de Astronomía de la Universidad de Chile.

The general conclusions concerning these four PN are as follows:

1) He2-109 is not a Type I PN, but it is an interesting object due to its large O abundance [$\log N(O)/N(H) = 9.16$] which is rather unusual. Shaw and Kaler (1989) have observed this PN and in their results they give an observed value for [O III] $\lambda 4959$ that is 17% higher than ours; this seems to confirm our large O abundance.

2) He2-145 has characteristics which are close to those of a Type I PN [the abundance by number $y = 0.115$, $\log N(N)/N(H) = 8.51$, $\log N(O)/N(H) = 8.55$] but it does not quite satisfy the necessary conditions, being the value of y slightly smaller than is needed.

3) He2-152 is clearly a Type I PN, with a very high He contents ($y = 0.29$); it does not show any bipolar or filamentary structure and looks nearly circular.

4) He2-163 is a special object, since it shows variability in some of its lines. In three of the five spectra obtained in 1982 [N II] $\lambda 6583$ appears slightly stronger than $H\alpha$, while in the other two it appears slightly fainter. There are clear differences in some other emission lines, for example in the [O III] and [O II] lines: $\lambda 3727$ decreases in strength from 1982 to 1991, while the contrary is true for $\lambda 5007$.

References

Shaw, R.A., and Kaler, J.B. 1989, APJS, 69, 495.