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Velocity Fields in 9 Southern Planetary Nebulae

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Abstract. In 1997 and 1998 we observed 16 PN with the ESO 1.4 m CAT telescope, in the Hα and [NII] lines. We selected 9 PN with fairly symmetric line profiles, these PN we analyzed with the "Torun codes".

The derived expansion velocities are presented in Table 1. Column $v_{\rm exp}$ refers to the value of a constant velocity field, or in case of acceleration (i.e when $\Delta v > 0$), to the mass weighted average velocity. The differences between velocities at the outer and inner nebular radius are given in next column: Δv. In the column $v_{\rm turb}$ we give the values deduced for the turbulent broadening.

We proved that for the PN with [WC]-type nuclei the internal motions are best represented by a constant expansion velocity with superimposed turbulence. On the contrary the non-[WC] PN show no sign of such high turbulence, they present instead a clear evidence of outward acceleration.

The paper "Turbulent nebulae around [WC]-type stars" (Acker et al. 2002), contains the details of the analysis and the extended discussion.

Table 1. The nebular data and the analysis results

PN G	name	planetary nebula				results		
		c.star type	diam arcsec	$R_{\rm out}$ [pc]	$M_{\rm ion}$ [$M_\odot$]	$v_{\rm exp}$	Δv	$v_{\rm turb}$
						[km s^{-1}]		
003.1+02.9	Hb 4	WC	6.7	0.065	0.2	16	0	14
029.2-05.9	NGC 6751	WC 4	21	0.1	0.15	41	0	15
027.6+04.2	M 2-43	WC 8	1.6	0.02	0.04	20	0	10
327.1-02.2	He 2-142	WC 9	3.6	0.03	0.03	20	0	7
352.9+11.4	K 2-16	WC 11	20	0.05	0.002	34	0	12
001.5-06.7	SwSt 1	wels	1.3	0.007	0.01	17	12	14
355.9-04.2	M 1-30	wels	3.6	0.07	0.22	22	28	0
345.2-08.8	Tc 1	Of(H)	10	0.05	0.05	20	34	0
359.2-33.5	CRBB 1	O(H)	9	0.08	0.18	13	21	0

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References

Acker et al. 2002, A&A in press