

STALLED WINDS: INTERACTIONS BETWEEN NEBULAE AND STELLAR WINDS

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ABSTRACT. Spectra of the nuclei of two planetaries show what appear to be features caused by fast stellar winds as they encounter the surrounding nebulae. Superimposed upon the high velocity ( $3670 \text{ km s}^{-1}$ ) ultraviolet P Cygni profiles of Abell 78 are low velocity absorption lines that likely arise from a density enhancement in the wind as it brakes and builds up against the inner edge of the nebula. The deepest portions of these narrow absorptions fall at  $-78 \text{ km s}^{-1}$  for N V and O V and  $-26 \text{ km s}^{-1}$  for C IV, which implies a gradient in the decelerating wind, as does the profile of the strongest C IV line. The lower value may be related to the expansion velocity of the inner helium-rich nebulosity, which we associate with a sharp absorption feature. Another density enhancement, evidenced only by absorption lines, appears at  $-250 \text{ km s}^{-1}$ , and may be caused by a rebound shock of the sort envisioned by Kahn (*IAU Symposium No. 103, Planetary Nebulae*, 1983, 305) and Okorokov *et al.* (*Astr. Ap.*, 1985, 142, 441).

In addition, the nucleus of NGC 2371 exhibits narrow O VI lines at  $\lambda 3811$  and  $\lambda 3834$  (first detected by Aller, *IAU Symposium No. 38, Planetary Nebulae*, 1968, 339) superimposed upon the broad underlying blend produced by the fast ( $3400 \text{ km s}^{-1}$ ) stellar wind that seem to be produced by the same phenomenon. M3-30 is an additional candidate. These observations provide at least part of the evidence needed to demonstrate the idea that the fast winds can affect and even shape the surrounding nebulae.