

# Multiwavelength Kinematics of the PNe Humason 1–2 and NGC 7662

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The conventional interpretation of the "Wilson effect" is based on the fact that, in a simple photoionization model of a thick shell in free expansion, the elements with a high ionization potential are found in the innermost part of the shell, which move slower than the outer regions where the low ionization ions are located. A real PN is however a much more complex object than in the picture above. For these reasons, we are carrying on a project aimed at studying in detail the Wilson effect in a large number of objects of different types. We present here preliminary results for two PNe, the bipolar nebula Hu 1-2 and the elliptical NGC 7662. Observations have been secured with the Utrecht Echelle Spectrograph placed at 4.2m William Herschel Telescope, (La Palma, Canary Islands). The spatial resolution is 0.36 arcsec, and the resolving power  $R=46000$ . The results are presented in Table 1. The increase of expansion velocity with decreasing potential is clearly seen except for Hydrogen. This ion is a quite peculiar case : although its ionization potential is quite low, this element behaves also as a high excitation atom since it has only one possible ionized state. Furthermore, as we have spatial resolution we can study this relation between velocity and ionization potential in different points of the nebula.

REFERENCES

O.C.Wilson, ApJ.,1950,111,279

| <i>Ion (Energy (eV))</i> | <i>Hu 1–2 (Km/s)</i> | <i>NGC 7662 (Km/s)</i> |
|--------------------------|----------------------|------------------------|
| [OI] (0.0)               | 37.6                 | –                      |
| [SII] (10.36)            | 37.8                 | 29.5                   |
| HI (13.59)               | 27.1                 | 24.8                   |
| [OII] (13.61)            | 35.9                 | 26.3                   |
| [NII] (14.53)            | 35.5                 | 29.4                   |
| [SIII] (23.4)            | 31.1                 | –                      |
| HeI (24.58)              | 34.0                 | 26.9                   |
| [ArIII] (27.63)          | 32.9                 | –                      |
| [OIII] (35.12)           | 30.4                 | 26.7                   |
| [ArIV] (40.9)            | 20.1                 | 24.3                   |
| HeII (54.17)             | 19.6                 | 23.1                   |
| [ArV] (59.79)            | 14.4                 | –                      |

Table 1. The Wilson effect in Hu 1–2 and NGC 7662.