

The Central Stars of the Planetary Nebulae NGC 7027 and NGC 6543

P.A.M. van Hoof¹, D.A. Beintema², F. Lahuis³ and S.R. Pottasch¹

¹Kapteyn Astronomical Institute, Groningen;

²SRON Laboratory for Space Research, Groningen;

³Agencia Espacial Europea, Villafranca del Castillo, Madrid

Infrared spectra of NGC 7027 and NGC 6543 ranging from 2.4 μm to 45 μm were obtained with the Short Wavelength Spectrometer on board the Infrared Space Observatory. A first analysis of these spectra, with the aid of photo-ionization models, is presented in Beintema et al. (1996).

We report the first detection of the [Ar VI] 4.53 μm and [Ne VI] 7.65 μm lines in the spectrum of NGC 7027 (Fig. 1). When compared with older observations it is clear that the [Ar VI] line and possibly also other lines have increased in strength since 1981. We argue that a likely explanation for this variability is a change in the spectral energy distribution of the central star, possibly an increase in effective temperature. However, this result needs to be confirmed by further observations.

We also report a non-detection of the [O IV] 25.9 μm line and the first detection of the [Na III] 7.32 μm line in the spectrum of NGC 6543. The non-detection is not expected based on a blackbody approximation for the spectrum of the central star. The ionization threshold for O^{3+} is just beyond the He II limit, and the absence of this line shows that the stellar flux drops at least by a factor 350 at the He II limit. Modeling the [O IV] line may prove to be a valuable test for atmosphere models.

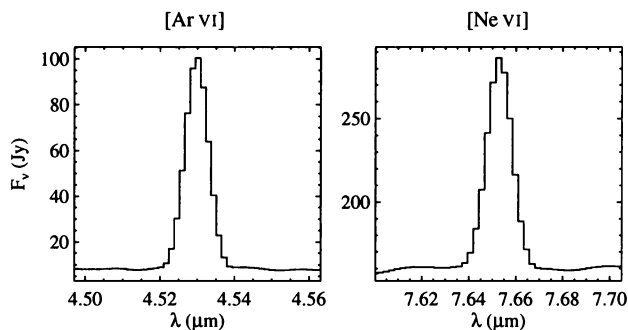


Figure 1: The observed [Ar VI] and [Ne VI] lines in the spectrum of NGC 7027.

REFERENCES

Beintema D.A., van Hoof P.A.M., Lahuis F. et al., 1996, A&A, 315, L253