some central stars.

The main conclusions are:

1. Central stars of planetary nebulae with O-Of, OVI and continuous spectra appear to be reproduced in the interval 1200-2000 Å by black-body of very high to infinite temperature.

2. Considering only the spectral range 1500-2000 Å, a better representation is obtained with temperatures of 30-50,000 K for O-Of stars, or with substantially higher temperatures for objects with OVI or continuous spectra.

From these results it is evident that the spectral range 1200-1500 Å is particularly important for the evaluation of the colour temperature of central stars of planetary nebulae and that black-body temperatures deduced from the spectral range λ > 1500 Å cannot represent the 1200-1500 Å interval.

ULTRA-VIOLET SPECTROPHOTOMETRY OF SOME HOTTER CENTRAL STARS

R.E.S. Clegg, M.J. Seaton
University College London, UK

A spectrophotometric survey has been made for about 20 central stars of planetary nebulae, with emphasis mainly on hot stars. We use low-resolution IUE spectra, observed by ourselves or obtained from Data Center, together with, in some cases, results from optical observations. Data have been extracted and merged, regions of saturation eliminated, ITF errors corrected and nebular continua subtracted. Careful assessments have been made of reddening constants, and of data used to calculate Zanstra temperatures.

The stellar energy distributions have been compared with those for black-bodies, LTE line-blanketed models, and NLTE models. We find no evidence for conflict between colour temperatures and He II Zanstra temperatures (allowing in some cases, for the possibility of incomplete absorption by He II).

Our study includes the seven stars studied spectroscopically by Heap (1977) and the six stars for which Mendez et al. (1981) have made NLTE models. For all but one of the objects considered by Mendez et al., black-body colour temperatures and He II Zanstra temperatures are higher than those obtained from analysis of spectral features using static plane parallel NLTE models.

Our results do not provide confirmation for evidence of absorption by H_2^+, discussed by Heap and Stecher (1980).

AN OPTICAL AND ULTRAVIOLET STUDY OF NINE LOW-EXCITATION PLANETARY NEBULAE

S. Adams, M.J. Barlow
University College London, UK

Ultraviolet and optical observations of seven very low excitation nebulae (He 2-131, He 2-138, TC 1, M 1-11, M 1-12, M 1-26, H 2-1) and of two low-excitation nebulae (IC 418 and He 2-108) are discussed.

The very low excitation (VLE) objects are classed as having I([OIII] λ 5007)/I(Hβ) < 1, while the two low-excitation objects have [OIII]/Hβ < 2. No HeII emission lines are seen. Electron temperatures and densities are determined from forbidden line ratios. A nebular density gradient is inferred for He 2-108 and H 2-1. The C/O ratio is determined for IC 418, He 2-131 and TC 1; upper limits on C/O are obtained for He 2-138 and He 2-108.

IC 418, which has C/O > 1 (Harrington et al., 1980), is known to show SiC in emission between 10 and 12 μm. We have no UV data on M 1-11 which also shows SiC in emission. However He 2-108, He 2-131, He 2-138 and TC 1 all have C/O < 1, consistent with the infrared data which indicate silicate emission from the three that have been observed.

The reddening constant c(Hβ) is deduced from the λ 2200 interstellar absorption feature for six of the objects. In all cases the resultant value is less than that obtained from Radio/Hβ measurements. The discrepancy is particularly large for the case of M 1-26.

The stellar continuum of each object has been examined. Significant line blanketing occurs between 1200 Å and 1900 Å in all of the objects for which we have data. The HI and HeI Zanstra temperatures are found to be grossly inconsistent with the optical and UV colour temperatures when using black-body models, LTE line-blanketed plane-parallel models (Kurucz, 1979), or NLTE plane-parallel models (Mihalas, 1972). By contrast, the optical and UV continuum of IC 418 is well matched by a spherically extended NLTE model atmosphere with $T(\tau = 2/3)$ = 29 700 K and log $g(\tau = 2/3)$ = 2.96 (Model 6 of Kunasz, Hummer and Mihalas, 1975). This model also predicts the observed nebular fluxes in Hβ and HeI λ 5876 to within 15%. It is suggested that cooler extended model atmospheres