CENTRAL STAR AND NEBULAR MASSES FOR MAGELLANIC CLOUD PLANETARY NEBULAE

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ABSTRACT. AAT and IUE spectra of thirteen medium-excitation Magellanic Cloud planetary nebulae have been used to derive H I Zanstra effective temperatures and surface gravities for the central stars.

The known distances to the SMC and LMC allow the luminosity and the effective temperature of each central star to be plotted on the H-R diagram and its mass to be derived by interpolation between the theoretical evolutionary tracks of Schönberner (1979,1983) and Wood and Faulkner (1986). This derived mass, along with the stellar radius deduced from the central star analysis, give an estimate of log g, which can be used to check for consistency with the value of log g of the model atmosphere used in the analysis, in an iterative manner.

The mean mass for nine non-Wolf-Rayet (WR) central stars, assumed to be hydrogen shell burning, is 0.59±0.02 $M_\odot$, which compares well with the mean mass for DA white dwarfs of 0.58±0.10 $M_\odot$ (Weidemann and Koester 1984). Similarly, the mean mass derived for four WR central stars, assumed to be helium shell burning, of 0.59±0.01 $M_\odot$, is in good agreement with the mean mass estimated for DB white dwarfs by Oke *et al.* (1984), 0.55±0.10 $M_\odot$. The surface abundances and relative frequency of occurrence of each ($\sim$ 15%) are consistent with the hypothesis that DB white dwarfs originate from Wolf-Rayet central stars, the non-WR central stars giving rise to DA white dwarfs.

Nebular masses have been derived for a sample of twenty three Magellanic Cloud PN with $n_e \leq 4000$ cm^{-3}, using Hβ fluxes and [O II] doublet ratio electron densities, and a mean ionized hydrogen mass of 0.19±0.04 $M_\odot$ is found, corresponding to a mean ionized mass of 0.25±0.05 $M_\odot$.

S. Torres-Peimbert (ed.), Planetary Nebulae, 355.