

LUMINOSITIES OF CENTRAL STARS OF PN IN THE GALACTIC BULGE

R. H. MÉNDEZ

University Observatory, Munich, Federal Republic of Germany

A calibration of the nebular intensity of [O III] 5007 (relative to H_β) in terms of stellar bolometric corrections is presented. This calibration (restricted to low- and medium-excitation PN) is based exclusively on the results of non-LTE model atmosphere analyses of absorption-line profiles in the spectra of bright central stars of PN (Méndez et al. 1988, A&A 190, 113 and subsequent papers). Knowing the bolometric corrections, the distance to the Galactic center, the amount of interstellar extinction and the visual apparent magnitudes (Tylenda et al. 1989, A&AS 77, 39) of central stars of PN in the direction of the Galactic center, luminosities for 20 of these central stars are obtained without any assumptions about nebular properties. The luminosities obtained with this method are substantially higher than those obtained for the same objects by Pottasch and Acker (1989, A&A 221, 123) and Tylenda et al. (1991, A&A 246, 221). The most probable explanation for this discrepancy is that luminosity estimates based on assumptions about nebular properties are too low, because many PN are not completely optically thick in the H Lyman continuum and/or because many ionizing photons in these PN are being absorbed by nebular dust. Which of the two effects is more important cannot be decided without solving the problem of the discrepancy between extinction determinations based on the Balmer decrement versus extinction determinations based on radio and H_β fluxes (the radio- H_β extinctions are too low).

The higher luminosities obtained here have removed the large discrepancy, reported by Pottasch and Acker, between nebular ages of a few thousand years and the stellar post-AGB ages of more than 100000 years that would be implied by the very low luminosities they obtained.