The Stellar Content of Obscured Galactic Giant HII Regions. VII. W3

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Spectrophotometric distances in the K band have been reported by different authors for a number of obscured Galactic HII regions. Almost 50% of them show large discrepancies compared to the classical method using radial velocities measured in the radio spectral region. In order to provide a crucial test of both methods, we selected a target which does not present particular difficulty for any method and which has been measured by as many techniques as possible. The W3 star forming complex, located in the Perseus arm, offers a splendid opportunity for such a task. We used the NIFS spectrograph on the Frederick C. Gillett Gemini North telescope to classify candidate "naked photosphere" OB stars based on 2MASS photometry. Two of the targets are revealed to be mid O-type main sequence stars leading to a distance of d = 2.20 kpc. This is in excellent agreement with the spectrophotometric distance derived in the optical band (d = 2.18 kpc, Humphreys 1978) and with a measurement of the W3 trigonometric parallax (d = 1.95 kpc, Xu et al. 2006). Such results confirm that the spectrophotometric distances in the K band are reliable. The radio derived kinematic distance, on the contrary, gives a distance twice as large (d = 4.2 kpc, Russeil 2003). This indicates that this region of Perseus arm does not follow the Galactic rotation curve, and this may be the case also for other HII regions for which discrepancies have been found.

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Comments:

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