POSTER PAPERS 2.

Chairman : J. GRAHAM

1. P.HELLINGS: Bolometric Corrections and Magnitudes of WO+O Stars.

2. T.NUGIS: Two Possible Wind Models for Wolf-Rayet stars.

3. M.AZZOPARDI and N.MEYSSONIER: A New Survey for H alpha Emission-Line Stars in the SMC.

4. B.BOHANNAN: A Large Sample of Emission-Line Stars in the LMC:Their Location in the H-R diagram.

5. D.J.STICKLAND, C.LLOYD and A.J.WILLIS: Is AS 431 a Superluminous WR Star?

6. M.SHARA and A.MOFFAT: Wolf-Rayet Stars in M31.

7. A.Moffat, M.Shara and W.Seggewis: The Luminous Stellar Content of 30 Doradus and NGC 3603 - The Nearest Visible Giant HII Regions.

8. C.LEITHERER, I.APPENZELLER, G.KLARE, H.J.G.L.M.LAMERS, O.STAHL, L.B.F.M.WATERS and B.WOLF: The Massive Stellar Wind of the Hubble-Sandage Variable S Doradus.

9. D.VANBEVEREN: The WR/OB Number Ratio within 2.5 kpc from the Sun.

10. T.E.ARMANDROFF, P.MASSEY and P.S.CONTI: Wolf-Rayet Stars in M31's OB Associations.

11. K.A.VAN DER HUCHT, T.A. JURRIENS, F.M. OLNON, P.S.THE, P.R. WESSELIUS, P.M. WILLIAMS: IRAS Observations of Wolf-Rayet Stars.

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12. P.J.McGREGOR, A.R.HYLAND and J.D.HILLIER:
Infrared Spectroscopy of Southern P Cygni Stars.

13. O.STAHL, B.WOLF, M.DE GROOT and C. LEITHERER:
High-Dispersion Spectroscopy of the Brightest Emission-Line Stars of the Magellanic Clouds.

14. R.VIOTTI, L.ROSSI, A.ALTAMORE, A.CASSATELLA:
New Results on Eta Carinae.
Evidence for an Asymmetric Inhomogeneous Wind.

15. B.WOLF and O.STAHL: MWC 300: A Runaway Hypergiant.

16. C.de JAGER and H.NIEUWENHUIJZEN:
Stellar Atmospheric Instability in the Upper Part of the H-R Diagram.

17. J.P.DE GREVE, P. HELLINGS and E.P.J.VAN DEN HEUVEL:
On the Occurrence of WR+O Binaries.

18. A.J.WILLIS, P.S.CONTI, C.D.GARMANY and I.D.HOWARTH:
Rapid Ultraviolet Spectral Variations in HD 50896 (WN + ?)

19. J.HILLIER: The Formation of Nitrogen and Carbon Lines in HD 50896 (WN5).

20. F.J.ZICKGRAF, B.WOLF, O.STAHL and C.LEITHERER:
B(e)-Stars in the Magellanic Clouds

21. A.J.WILLIS, I.D. HOWARTH, K.NANDY and D.H. MORGAN:
The Mass Loss Rate of Sk 80 (O7iaf) in the Small Magellanic Cloud.

22. H.ZINNECKER: How to Form a 200 M_o Star.

23. G.MURATORIO, M.FRIEDJUNG and R.VIOTTI:
FeII in the UV Spectrum of Luminous Emission Line Stars.

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BOLOMETRIC CORRECTIONS AND MAGNITUDES OF WR+O STARS

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Bolometric corrections and absolute magnitudes for WR stars have been evaluated by various authors. A review of the results may be found in De Jager (1980). The calibrations, relating BC or Mv with the spectral subtype, however strongly differ from author to author. Moreover, even with the same observational method a large scatter is found for the same subtype, as was recognised by Conti et al. (1983). The only trend found is the increase of Mv with the subtype from WN3 to WN7, and for the WC subtypes. In this study BC and Mv are computed for a number of WR+O binaries.

The results are based on model calculations for double lined spectroscopic WR+O binaries, for which mass estimates have been derived (Hellings, 1984). This was performed under the assumption that these binaries are formed by mass transfer in massive close binaries. The bolometric magnitude Mb of the WR star is obtained with the mass-luminosity relation for RLOF remnants, stars that may be identified with WR components in WR+O binaries. The Mb value of the O star is obtaind from the model calculations described by Hellings (ibid.). For these models a complete stellar structure picture is available. The visual absolute magnitude Mv of the O star is obtained from the BC scale of Underhill et al. (1979). If the difference between the magnitudes of the two components is known, Mv of the WR star is easily computed. If not, we apply the Mv scale of Conti et al. (1983), relating Mv with the subtype of the WR star. The error on the magnitudes of the O conponents is +/-0.3 mag. For the WR stars the error on Mb is +/-0.6, which is due to the width of the mass-luminosity relation, and the uncertainty of M(WR). Finally we conpute the distances of these systems with the results of Mv and with the photometric data ($b-v, b-v_o, m_v$) listed by Hidayat et al. (1982, 1984) and Lundstrom and Stenholm (1984). Possible membership of clusters and associations is discussed.

The results show no obvious relation between any of the variables Mb, Mv or BC and the subtype, which is hardly to expect with such a limited sample. Only for the WN stars, a fair correlation between Mv and the subtype is possible. The Mb values are in the range -7.6 to -8.9. This corresponds to a factor three in luminosity. The visual magnitudes are in the same range as the calibrations found in the literature : -3.5

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WR	Spc	Mb W	Mb O	Mv O	dMv	mv	Av	Mv W	BC W	y_o	y_oAC	AC
21	WN4	-8.5	-8.0	-4.5		9.80	2.58	-4.0	-4.5	12.2	12.1	Car OB1
31	WN4	-8.0	-8.5	-5.1		10.69	2.50	-4.0	-4.0	13.6		
42	WC7	-8.7	-8.1	-4.7	0.20	8.25	1.19	-4.5	-4.2	12.5	12.1	Car OB1
79	WC7	-8.3	-8.7	-5.2	0.75	6.95	1.39	-4.6	-3.7	11.3	11.5	NGC 6231
97	WN3	-7.6	-8.2	-4.9		11.15	3.65	-3.6	-4.0	12.7		
113	WC8	-8.8	-8.3	-5.0	0.00	9.43	3.36	-5.0	-3.8	11.8	11.5	Ser OB1
127	WN4	-8.1	-7.6	-4.6	1.30	10.36	2.21	-3.3	-4.8	13.1	13.2	Vul OB2
139	WN5	-8.2	-8.7	-5.3	1.50	8.27	2.91	-3.8	-4.4	10.9	11.2	Be 86
151	WN5	-7.8	-8.0	-4.7	0.00	12.40	4.22	-4.7	-3.1	13.7		

Table 1 : Photometric data for the sample : WR number, Spectral type, Mb for the WR and the O components, Mv for the O star, difference in Mv, apparent magnitude of the system, interstellar extinction correction, Mv of the WR star, Bc of the WR star, distance moduli of the system and of the cluster or association (if present), name of cluster or association.

to 4.5. BC values for the WR components are between -4 and -5, which is about one magnitude more than for O stars. For the WC stars, we find BC around -4, which is slightly less than for WN. On the other hand Mv for the WC stars is on the average 0.8 mag. higher. We stress that these results have only individual meaning. The sample is too small for drawing general calibrations. The Mv values of the O stars are scattered wihtin the error bars of the calibration for O stars of Conti et al. (1983).

The distances of these systems may then be computed with our magnitudes based on the model computations of the individual systems, and with the observational data. Six of the systems considered here are observed in the field of a cluster or an association. The conclusions on possible membership by Lundstrom and Stenholm (1984) are confirmed for WR 42, 79, 113, 127 and 133, taking into account the error bars. Lundstrom and Stenholm classify WR21 as a probable background object. We find its distance modulus to differ only 0.1 from the distance modulus of Car OB1, suggesting a probable membership. This difference is totally due to the magnitudes adopted for the O star, since we both used the Mv scale of Conti et al. (1983) for the WR component of this binary.

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