CANDIDATES OF BE STARS FOR GI2T INTERFEROMETRY

R. HIRATA
Department of Astronomy, Kyoto University, Kyoto, 606-01, Japan

Abstract. Eighteen bright Be stars have been observed polarimetrically and line- photometrically for searching for candidates for a direct measurement of the envelope diameters of Be stars by GI2T. I found that o Cas and 28 Tau are suitable in addition to γ Cas.

Mourard et al.(1989) have succeeded in the direct measurement of the envelope diameter of γ Cas at Hα. The GI2T has a potentiality which brings us direct information on the envelope structure around Be stars on a milliarcsecond scale. The candidates for GI2T must satisfy the following two conditions, in addition to a large stellar diameter: 1) the envelope projected on the sky is located near the north-south direction, or pole-on stars, 2) the Hα emission is strong.

I listed up 18 Be stars which are accessible by GI2T and whose stellar diameters are expected to be larger than about 0.3 milliarcsec(mas), assuming the envelope radius is at least three times larger than its stellar radius, i.e., 1 mas. Table 1 shows the list of the candidates.

Observations have been done, using the 8-channel photo-polarimeter attached to the 91-cm telescope at the Dodaira station of National Astronomical Observatory, since the winter season of 1988. The broad-band filters were employed with the effective wavelengths of 0.36, 0.42, 0.455, 0.53, 0.64, 0.69, 0.76 and 0.88μm. The accuracy is better than 0.05% in general. In November 1989, I introduced the Hα filters with FWHF of 260Å and 56Å, centered on 6563Å. Direct calibration of Dodaira Hα index was done for common Be stars through quasi-simultaneous spectroscopic observation with the Thomson CCD attached to the 60-cm telescope at the Ouda station, and from Kyoto University in 1989 October-December season. Both polarimetry and Hα photometry were repeated to examine their variability since then.

Very fortunately, the intrinsic polarization angles θ_* for eleven stars in Table 1 have been determined by Poeckert et al.(1979), and Poeckert and Marlborough (1976, 1979). For these stars, I made a consistency check, using data from us and from the literature, and found no contradiction except κ Dra. The time variation was examined for a direct estimation of θ_*. New values of θ_* were determined for three stars, including κ Dra. Regarding the residuals, the polarization degree is too small for further analysis. The last column in Table 1 shows the mean equivalent width of Hα (negative in emission). The mark 'v' indicates a gradual variation or large variation with time.

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As for candidates for GI2T observation, I pose the following two criteria: 1) the envelope is directed within 30° from north (60° < θ_* < 120°) or pole-on ($Ve \sin i$ <200km s^{-1}, and 2) the Hα emission is strong, say, < −20Å.

Then, o Cas and 28 Tau are the best candidates in addition to γ Cas. β CMi and η Tau are possible candidates from their large stellar angular diameters, though their directions on the sky are unclear. o And and ζ Oph could be candidates when they show emission, though the former is a quadruple system.

References

Mourard, D., Bosc, I., Labeyrie, A., Kochelin, L., and Saha, S.: 1989, *Nature* **342**, 520
Poeckert, R., Bastien, P., and Landstreet, J. D.: 1979, *Astronomical Journal* **84**, 812
Poeckert, R., and Marlborough, J. M.: 1976, *Astrophysical Journal* **206**, 182
Poeckert, R., and Marlborough, J. M.: 1979, *Astrophysical Journal* **220**, 940

TABLE I
Object stars and Results

name	sp.type	V	$Ve \sin i$	distance	angular diameter	θ_*	source	$< W\alpha >$
		mag	km s^{-1}	parsec	mas	degree		A
o Cas	B5IIIe	4.5	255	210	.27	78	present	−24.4v
γ Cas	B0IVe	2.2	260	230	.39	105	PM79	−25.0v
ϕ And	B7Ve	4.3	75	140	.36	80	present	+1.8
ϕ Per	B2Vep	4.1	505	210	.26	26	PBL79	−38.3v
ψ Per	B5Ve	4.2	375	170	.34	44	PBL79	−30.3
17 Tau	B6IIIe	3.7	215	125	.43	?		+7.5
23 Tau	B6IVe	4.2	285	125	.35	?		−6.4
η Tau	B7IIIe	2.9	210	125	.72	?		−1.7
28 Tau	B8Ve	5.1	345	125	.28	73	PBL79	−25.9v
48 Per	B3Ve	4.0	230	110	.39	137	PBL79	−19.0
ζ Tau	B4IIIpe	3.0	320	160	.43	35	PM76	−14.2
ν Gem	B6IIIe	4.2	225	190	.34	34	PBL79	+1.8
β CMi	B8Ve	2.9	285	40	.73	?		+0.4
κ Dra	B6IIIpe	3.9	230	160	.41	15	present	−16.0
θ CrB	B6Vnne	4.1	385	100	.34	?		+9.2
ζ Oph	O9.5Vn	2.6	385	170	.49	133	PBL79	+9.4
o Aqr	B7IVe	4.7	305	130	.30	27	PBL79	−12.0
o And	B6IIIpe	3.6	320	115	.48	111	PBL79	+6.5v