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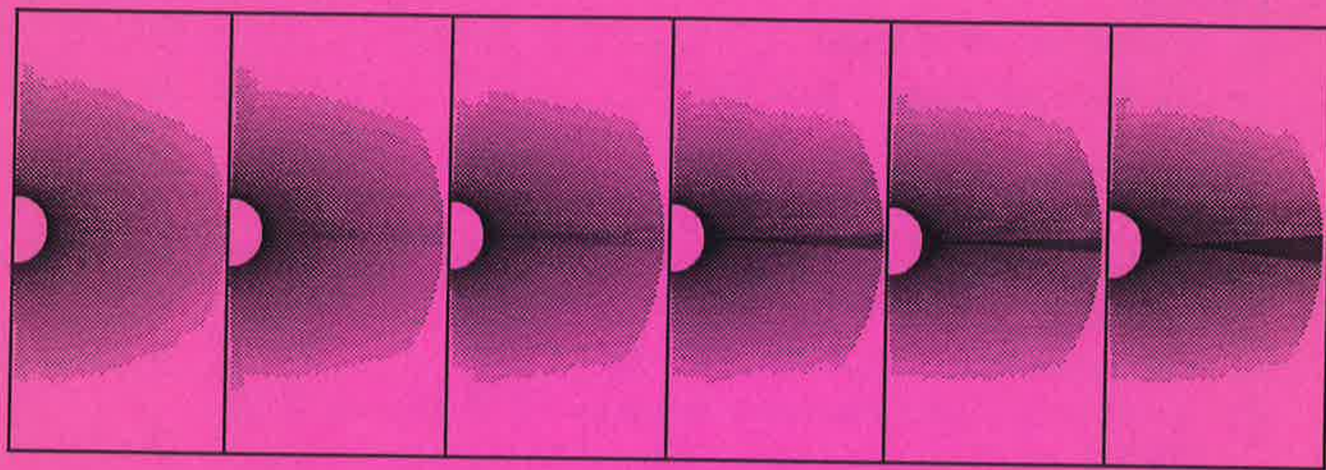

Be STAR NEWSLETTER

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Contents

1. EDITORIAL

1.1. A New Look

Greetings from a new editorial team and to a new look for the *Be Star Newsletter*. As mentioned in the last issue of the *Newsletter*, the SOC of the Working Group on Be Stars has recommended that future issues of the *Be Star Newsletter* be distributed electronically. Through the splendid efforts of Doug Gies and his colleagues at Georgia State University, we have been able to provide an electronic version of Issue No. 28 as well as a paper copy, which will be sent to all on the current mailing list.

Issue No. 28 contains the usual sections, including "Working Group Matters", "Contributions", "What's Happening?", "Preprints Received", "Bibliography" and "Meetings" of possible interest to the B star community. I would like to thank those who sent contributions and provided much appreciated help with the bibliography.

The new *Newsletter* will continue to undergo changes with the publication of subsequent issues. For the immediate future we request that contributions be sent to the editor-in-chief at the address given on the first page. We recommend that most communications be sent via Electronic Mail (SPAN/DECnet - HYADES::PETERS, Internet - peters@hyades.dnet.nasa.gov). If it is not possible to transmit the contribution electronically, we request that it be submitted in a camera-ready condition (see papers in the current issue for style). Contributions may also be sent by FAX (telephone number: 213-740-6342), but this is not recommended for papers that are longer than a half page or those that contain figures due to the degradation of the resolution. Dark, clear copies of all figures should be sent by regular mail. Illustrations may also be sent by E-mail as a PostScript file. Although ASCII versions are acceptable, we prefer that contributions be sent electronically as a Tex or LaTex file. If the contribution is submitted by E-mail, please send a copy to the technical editor, Doug Gies (Internet - gies@chara.gsu.edu). Contributions for Issue No. 29, which will go to press in late 1994, should be received by:

October 15, 1994.

I am looking forward to seeing you at the forthcoming IAU General Assembly in The Hague, NL in August 1994. Please let me know your impressions of the new *Newsletter* and how we might improve it for future issues.

Gerrie Peters, Editor-in-Chief / peters@hyades.dnet.nasa.gov

1.2. The Electronic Journal

It is a pleasure to welcome readers to the first electronic issue of *The Be Star Newsletter*. The format and content will surely evolve over the next few issues, and we welcome your feedback and direction. Our goal is to provide a timely distribution of news about the hot stars in much the same way as the *Newsletter* has done in the past.

The *Newsletter* is available in three formats:

- A paper version distributed to libraries and subscribers who prefer this medium (see the Note to Subscribers at the end of this issue).

- A plain text version that is distributed electronically to subscribers and is available through anonymous ftp from `chara.gsu.edu` (`BeNews/news28.txt`). Articles containing figures are also available in this subdirectory as PostScript files (with names ending in `.ps`).

- The *Newsletter* is also available using the Mosaic program on the World Wide Web. This is perhaps the fastest and most convenient way to read the *Newsletter*. If you have this facility available to you, enter the following Uniform Resource Locator (URL): `http://chara.gsu.edu/BeNews/intro.html`

If you do not have Mosaic but you have Internet access, you might consider obtaining the Mosaic software by anonymous ftp from `ftp.ncsa.uiuc.edu` (National Center for Supercomputing Applications at the University of Illinois at Urbana-Champaign). They distribute software for most Unix-based systems, Apple Macintosh, and Microsoft Windows.

This first electronic issue was created through the efforts of many people, and I would like to thank in particular Bill Hartkopf (CHARA, GSU), for his help in placing the *Newsletter* on the *WWW*, and my summer student Joyce Janowsky for her great assistance in many editorial tasks. I am also grateful to Dr. Neil J. Calkin (School of Mathematics, Georgia Institute of Technology) who provided me with an excellent example of an electronic newsletter with his Electronic Journal of Combinatorics.

A special word of thanks is due to Stan Owocki, Ken Gayley, and Steve Cranmer (BRI, Univ. Delaware) for providing the cover illustration. It depicts gas density variations surrounding a hot, main sequence star rotating with equatorial speeds of 200 to 450 km sec^{-1} (at 50 km sec^{-1} intervals). These simulations show how gas leaving the star into the wind can follow trajectories that intersect in an equatorial disk. For further information on such "wind compressed disks" see Bjorkman & Cassinelli (1993, ApJ, 409, 429) and Owocki, Cranmer, & Blondin (1994, ApJ, 424, 887; see Fig. 6).

On behalf of the entire readership of the *Newsletter*, I would like to extend our sincere gratitude to Dietrich Baade and staff at the European Southern Observatory headquarters who have overseen the production and distribution of the *Newsletter* from 1987 until now. The electronic and paper distribution will now be done at Georgia State University in Atlanta, and we hope we can build on Dietrich's legacy.

Please consider sending us contributions both big and small that would be of interest to the community. We also welcome your comments on the articles; we will post these comments on the *WWW* version of the *Newsletter*. We plan to distribute the *Newsletter* twice a year but we will send out timely notices of observing campaigns, etc., by electronic means as the need arises.

Douglas R. Gies / gies@chara.gsu.edu

2. WORKING GROUP MATTERS

2.1. WG to meet in the Hague

The IAU Working Group on Be Stars will meet during the IAU General Assembly in The Hague. Luis Balona (lab@saao.ac.za), Chair of the WG, has arranged to meet on August 20 at 11 am (place to be announced) for the regular business meeting and to discuss the scope of activities within the *Newsletter* and the WG (including a change in name to the "Working Group on B stars"; see Balona, L. 1994, *Be Newsletter*, **27**, 4). Please plan to attend if you are travelling to the GA this year.

The new members of the working group are:

D. Baade (dbaade@eso.org)
J. Cassinelli (casinelli@madraf.astro.wisc.edu)
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M.A. Smith (Chair-elect) (msmith@iuegtc.dnet.nasa.gov)
R. Waters (rens@sron.rug.nl)

3. CONTRIBUTIONS

3.1. A Recent Emission Episode of Lambda Eri

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The well-known Be star λ Eri was a target in the campaign series announced and coordinated by R. Hirata (1993, Be Star Newsletter, 26, 20). The campaign was realized on February 1 - 7, 1994, and was focused mainly on a study of rapid variability of the He I λ6678 line and simultaneous *uvby* photometry.

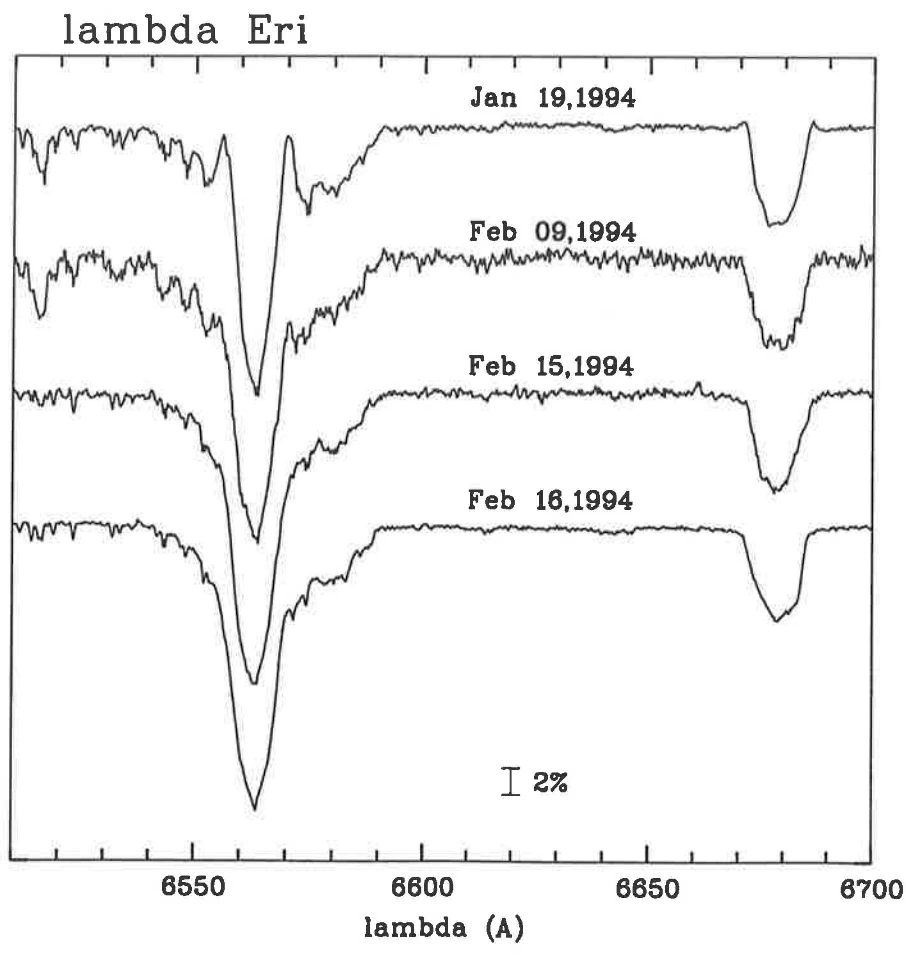
As a part of the campaign, the author carried out monitoring of the Hα profile with the Ondřejov 2m telescope equipped with a Reticon at the coudé focus. Although only few spectra were obtained due to very bad weather conditions, they document the development of a short emission episode in January 1994 and its decay in January and February, 1994. Because the star is frequently studied in order to find relations between pulsation characteristics and emission activity, we present here this information as a preliminary result of the campaign. A more detailed analysis of the emission phase will be published together with the other results of the campaign.

Some of the normalized Ondřejov spectra are plotted in Figure 1. Two spectra obtained on January 19, 1994, show Hα emission wings of about 5% of the continuum intensity and reaching almost to the continuum level. Emission became evident also in the absorption core, the depth of which was decreased by 1 - 2%. Weak emission wings can be recognized in the He I λ6678 profile.

Weak emission wings in Hα may be still present in the noisy profile of February 9, 1994, obtained under poor observing conditions. However, no emission is apparent either in spectra obtained at Okayama and Dominion Astrophysical Observatory during the campaign nor in Ondřejov spectra of February 15 and 16. In spite of many atmospheric lines in the Hα region, Figure 1 documents also the appearance of a transient shell spectrum. A strong shell line of Fe I λ6516 was observed in January and on February 9, 1994, but had entirely disappeared in the spectra of February 15 and 16.

Spectra of the He I λ6678 profile were obtained by Hirata (priv. comm.) at the Okayama Observatory on December 26 and 27, 1993. An *IUE* image taken by Peters on January 21, 1994, shows a remarkable increase of the equivalent width of the C IV doublet (Be Star Newsletter, 27, 14).

This last cycle of activity in λ Eri shows that emission episodes in some Be stars may persist only for a few weeks and can escape detection even in the case of the most frequently monitored targets.



3.2. A Simulation of NRP and Profile Variability

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The absorption line profile variability (*lpv*) observed in Be stars may have its origin in nonradial pulsation (NRP; see Smith 1991, Be Star Newsletter, 23, 5). Because these pulsations can affect both photospheric velocity fields and temperatures, the complexities of the NRP model can make it difficult to relate to observed features such as the photometric and profile variability. We have constructed a model code to calculate the pulsations and their observational consequences, and here we describe one such simulation that is available to users of the Interactive Data Language (IDL).

The light curve and profile synthesis program we have written is based on the NRP formulation of Buta & Smith (1979, ApJ, 232, 213). The code is a surface integration scheme that represents the pulsations as Legendre polynomials. The code includes the geometric Roche distortion of a rapidly rotating star and the temperature variations that result from gravity darkening and NRP.

We have applied the code to the case of λ Eri to present a specific example of NRP variability. The stellar parameters for λ Eri are taken from Smith, Peters, & Grady (1991, ApJ, 367, 302): $R_e = 7\ R_\odot$, $M = 12\ M_\odot$, $i = 90°$, and $V \sin i = 310$ km s^{-1}. For spheroidal modes, the ratio of horizontal to vertical velocity amplitude k follows from the assumed mass, radius, and corotation frequency, and from the adopted NRP mode $l = -m = 2$ and period $P = 16.84$ hours, we obtain $k = 24.6$ (essentially all horizontal motion). If the oscillations are adiabatic, then the temperature variation follows from k (Buta & Smith 1979): $dT/T = 58\ dR/R$. The only free parameter in the model is the vertical velocity semi-amplitude A_r which we set at $A_r = 0.65$ km s^{-1} based on a rough fit of the observed *lpv* during a campaign in November 1987. This leads to a horizontal velocity semi-amplitude $A_h = 16.0$ km s^{-1}, fractional radius semi-amplitude $dR/R = 0.13\%$, and a fractional temperature semi-amplitude $dT/T = 7.4\%$.

We have created images of the stellar brightness distribution and the corresponding profile shape (for He I λ4921) for 20 time steps through the $l = -m = 2$ period. The upper part of the image represents the UV flux distribution of the star (where the NRP waves can cause an integrated flux variation of $\approx 20\%$). The lower part illustrates the variations in the He I λ4921 absorption line. The variations are dominated by Doppler shifts due to NRP induced horizontal velocity fields, and the key characteristic of this *lpv* is its dominance in the line wings.

The combined results can be examined using an IDL procedure that uses the routine "xinteranimate" to create a movie on the terminal (a short MPEG movie version is also available on the World Wide Web version of the *Be Star Newsletter*). The procedure "nrpmovie.pro" and data file "nrp.pics" (binary) are available by anonymous ftp from chara.gsu.edu (in subdirectory "Gies"), and this routine should run on any version of IDL Version 3.0 or higher.

We thank Joyce Janowsky for transforming the sequence of images to an MPEG movie. This work was supported by NSF grant AST-9115121.

3.3. "Velocity Variations" Associated with Nonradial Pulsation

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The rapid variations in the absorption lines of Be and other hot stars are often complex in appearance, and observers usually begin their analysis of the profiles by measuring radial velocities. This is an important step if the star in question is a spectroscopic binary in addition to being a profile variable. If the star is indeed a binary, then it would be appropriate to account for orbital Doppler shifts (by shifting the spectrum to the center of mass reference frame) before studying the intrinsic profile variations. However, the line profile variability (*lpv*) associated with nonradial pulsation (NRP) can yield apparent radial velocity variations (cyclic with the NRP period) that should not be confused with binary orbital motion. Here I present a short discussion of the apparent radial velocity variations found in a sequence of model NRP profiles for a $l = -m = 2$ mode.

The model profiles were calculated to study the *lpv* and photometric variations observed in λ Eri during a coordinated campaign in November 1987. The model flux distributions and line profiles are described in a companion article (Gies, D. R., & Hahula, M. E. 1994, Be Star Newsletter, 28) and are available in digital form. The model He I λ4921 profiles display blue-to-red moving patterns that have greatest amplitude in the line wings, and the line has large asymmetries at NRP phases 0.0 and 0.5 (where the passage of a bright sector across the central meridian occurs at NRP phase 0.25). I measured the "radial velocity" of these two asymmetric profiles to obtain the maximum range in velocity that would be associated with a such a low order mode of NRP.

I measured the "radial velocity" using several techniques common to observers, and I list these below in order of increasing measured velocity amplitude.

Parabolic fitting of the line core: I fit the lower central half of the absorption line with a parabola and then took the minimum of the parabola as the position of line center. The velocity so measured varies by 37.3 km s^{-1} for the model profiles.

Cross-correlation: The profiles were cross-correlated with a reference profile calculated for the case of no pulsation. The minima of the cross-correlation functions yield a velocity range of 45.1 km s^{-1} between the two asymmetric profiles.

First moment: I calculated the standard first moment of each profile (normalized by line equivalent width). The shifts in the first moment amount to a velocity range of 45.8 km s^{-1} between the two asymmetric profiles.

Line bisector: The line bisector was drawn at an intensity equal to 10% of the central line depth below the continuum, and the midpoint of this bisector was taken to represent the line midpoint. The velocity range so derived is 47.3 km s^{-1} between the two asymmetric profiles.

These tests indicate that significant apparent radial velocity shifts can result from low order NRP. This supports the argument (Bolton, C. T., & Štefl, S. 1990, in Angular Momentum and Mass Loss for Hot Stars, ed. L. A. Willson & R. Stalio (Dordrecht: Kluwer Academic), 191) that the radial velocity variations observed in λ Eri do reflect the presence of low order NRP. The largest full amplitude of variation measured by Bolton & Štefl (by cross-correlation techniques) was 47.6 km s^{-1} (in 1976), which is close to the model results presented here. Thus the NRP amplitude used in this model sequence is probably close to the maximum allowed by the observations of λ Eri, and I expect that the observed velocity variations in stars like λ Eri will generally be smaller than those presented here. Nevertheless, observers should exercise caution in applying "orbital Doppler shifts" to spectra where the velocity variations may result in part or in full from NRP.

This work was supported by NSF grant AST-9115121.

3.4. H-alpha Observations of Kappa Dra and Kappa CMa

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Joint Laboratory for Optical Astronomy and Beijing Astronomical Observatory
Chinese Academy of Sciences

A three year monitoring of Hα in two Be stars, κ Dra and κ CMa, is presented. The observations were made on the 1-meter reflector at Yunnan Astronomical Observatory. The spectrograph is located at the coudé focus with a CCD as the detector. The reciprocal dispersion is 4.16 Å mm^{-1} and the spectral resolving power is greater than 30000 around Hα. A description of the features in the Hα line obtained on these two stars is given below.

κ Dra - All of the profiles of the Hα line are shown in Figure 1. In Figure 1a, the spectra obtained in the same observational run are plotted together with the same continuum level so that we can see its short term variability. There are three runs spread over three years. The observing dates are marked in the figure and the number of the spectra obtained on one night are also given in the parentheses following the dates. Obviously, no short term variations were detected during the observations. But when we averaged the spectra obtained in one run and plotted them together to make a comparison of their intensities (see Fig. 1b), we find that the Hα emission intensity in 1993 to 1994 is lower than that in 1991, while in 1993 to 1994, the change was not so significant. Overall. we find that the Hα intensity tended to decrease from 1991 to 1994.

κ CMa - We began to observe this star in March 1993. At that time, we found that its Hα profile varied evidently with a trend of increasing intensity (Hao 1993, Be Star Newsletter, 26, 18). In February 1994, we continued to monitor this star in

Hα and obtained two profiles on two nights. In order to check its secular variability, we plotted the spectra in Figure 2a. The spectra of March 3, 4, and 5, 1993, are the averages for each night. The residual spectra obtained by subtracting the averaged spectra of all five are shown in Figure 2b, from which, the intensity increase during 1993 to 1994 is clearly seen. The variation is just opposite of that of κ Dra.

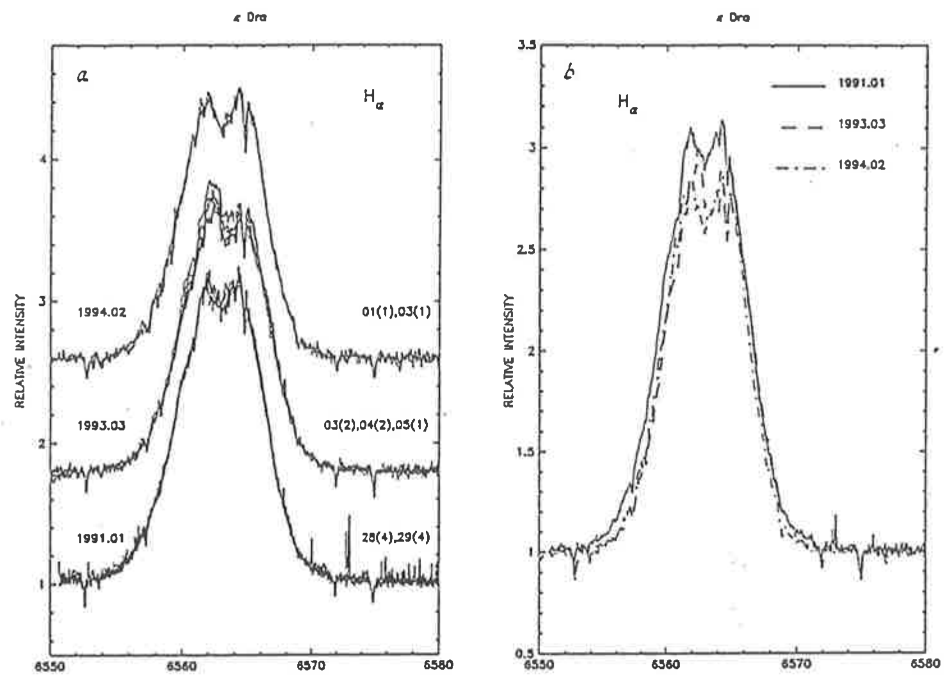

Fig.1

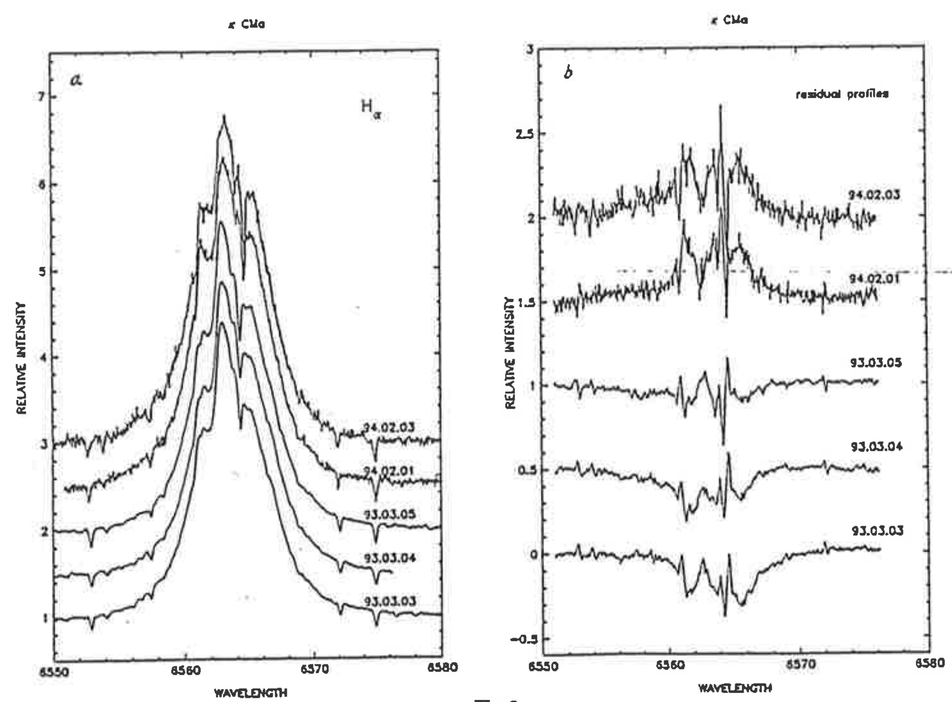

Fig.2

4. WHAT'S HAPPENING?

4.1. Observing Campaign on Lambda Eri

An Invitation to Participate in a Fall 1994 Campaign

After some discussion with several workers, I decided to propose an international campaign in the latter half of 1994 as follows:
Target: Lambda Eri (R.A.=5:09:09,Decl=-08:45.3 on 2000.0)
Epoch : 1994 Nov. 12-18 (one week)
Notice that the full moon is on Nov. 18, the last day of the campaign. This star was observed in our last campaign (1994 Feb. 1-7), but the time coverage was unfortunately poor. Because of its current importance, I propose this star again, expecting the participation from southern hemisphere observers both in spectroscopy and photometry. I hope that multi-line spectroscopy and also full time coverage photometry extends before and after the epoch above. Because of the extensive observing requirements, I propose only one campaign in the latter half of 1994.

The scientific objective is the same as in our last (1994 February) campaign. If you intend to take part in this campaign, please contact me. If you wish to have a copy of my proposal from the February campaign (including the scientific justification), please contact me at:

`hirata@kusastro.kyoto-u.ac.jp`.

Weather conditions at each site are important in planning future targets. From our experience in the past campaigns in 1993 and 1994, we succeeded in getting dense spectroscopic coverage in May (on Zeta Oph) and early September (on EW Lac), but we did worse in October (on Gamma Cas) and in February (on Lambda Eri). The photometry in UBV or uvby was not extensive, although I admit our campaign is mainly focused on spectroscopy. It seems that one important point is the weather condition at each site, so I would like to ask participants to send me information on the weather conditions at your site in each season. Though monthly quantitative information is desirable, I would like to know, at least, some qualitative remarks about each season. Also, please let me know your opinions on this and future campaigns.

It is important to discuss our future targets in 1995 and after as early as possible. If you have identified interesting Be stars with short-term variations from your observations or others, your proposal is welcome. Please, let me know them with a description of their scientific interest.

Ryuko Hirata / hirata@kusastro.kyoto-u.ac.jp

4.2. Observing Campaign on O-stars

An Invitation to Participate in a Fall 1994 Campaign

From 14-23 October 1994 we will conduct one more extensive campaign of UV and optical spectroscopy (now including the instrumentation to detect magnetic fields) on O stars, with main targets Xi Per, 68 Cyg, Lambda Cep, 19 Cep, Zeta Ori, and Lambda Ori. H-alpha + He II 4686 that are the most important lines to cover, to test the possible correlation between excess H-alpha emission and the appearance of a new discrete absorption component in the UV wind lines. Here is the list of the telescopes involved so far. The other participants include Lex Kaper, John Telting, David Bohlender, John Landstreet, Grant Hill, Vilppu Piirola, Ted Kennelly, Yiman Jiang, David McDavid, Huilai Cao, and Yulian Guo.

Telescope	Instrument	Dates	Nights	Remarks
IUE	High res. spectroscopy	17 - 21 Oct	5.5	Scheduled
CFHT 4m	UWO polarimeter	17 - 21 Oct	4	Scheduled
OHP 1.5m, France	H alpha spectroscopy	14 - 21 Oct	7	Scheduled
JKT 1m, La Palma	red spectroscopy	14 - 23 Oct	10	Scheduled
NOT 2.5m La Palma	polarimeter, photometry	14 - 23 Oct	10	Applied
TBD Canada	H alpha spectroscopy	14 - 21 Oct	7	Applied
Texas, D. McDavid	polarimetry, photometry	14 - 21 Oct	7	Scheduled
Xinglong China .6m	photometry	14 - 21 Oct	7	Scheduled
Yunnan 1m China	H-alpha spectroscopy	14 - 21 Oct	7	Scheduled

We are especially interested in North American observers. Please contact me for more information (I will be out of town between 19 July and 13 August 1994).

Huib Henrichs / huib@astro.uva.nl

4.3. Hot Star Newsletter

Dear colleague,

We plan to start a Wolf-Rayet electronic newsletter, on the model of the newsletters on star formation and on AGB stars. These newsletters reproduce, in LaTeX format, abstracts of papers to appear in refereed journals, abstracts of doctoral dissertations as well as news (jobs, conferences, etc). They help the exchange of information at an age when even preprints seem slow and sometimes difficult to obtain.

The Wolf-Rayet newsletter will cover all topics related to evolved massive stars, including Wolf-Rayet stars, LBV, Of and O stars, and related phenomena in galaxies. Supernovae fall outside the scope of this newsletter.

I would appreciate if you could send me an abstract in electronic form (preferably LaTeX) of your most recent papers accepted for publication in refereed journals, along with the name of the journal and affiliation of the authors.

Thank you for your collaboration.

Philippe Eenens / eenens@astroscu.unam.mx

5. PREPRINTS RECEIVED

5.1. Near-IR variability of Be stars

S. M. Dougherty and A. R. Taylor
e-mail: smd@starul.livjm.ac.uk

Near-IR observations of 125 Be stars from twelve epochs in the period 1972 to 1991 are combined to identify near-IR-variable Be stars. This study represents the first time that IR-variable Be stars have been studied in a statistically robust manner. A sample of non-variable Be stars is identified and used to ensure that a consistent photometric system is applied to all epochs of data, and that quoted uncertainties are consistent with observational scatter at each epoch. The percentage of variable stars increases with wavelength. In the K band 18 per cent of the sample (21 stars) are identified as variables. The amplitude of variations also increases with wavelength. The variations are shown to be due to variations in the circumstellar plasma as opposed to photospheric variations. The amplitude of variations ranges from $\Delta m = 0.2$ up to $\Delta m = 1.2$. Attributing the variations to circumstellar plasma density fluctuations, it is shown that in an optically thin or partially optically thick circumstellar envelope a variation of $\Delta m = 0.5$ requires a change in plasma density $\Delta\rho/\rho = 2 - 3$. The temporal behaviour of the variations is presented. The observed time-scale of variations ranges from 73 d to 18.5 yr. The minimum observed time-scale of variation is consistent with the travel time through the emitting volume.

5.2. Near-IR excess of Be stars

S.M. Dougherty, L.B.F.M. Waters, G. Burki, J. Cote, N. Cramer, M.H. van Kerkwijk, and A.R. Taylor
e-mail: smd@starul.livjm.ac.uk

The near-IR excess emission of 144 Be stars is derived from visual and near-IR observations. The quasi-simultaneous nature of the observations provide colour excesses that are independent of temporal variations. Colour-colour diagrams are used to identify stars with excess colours markedly different from the bulk of the sample stars. The near-IR emission of four stars that have markedly different colours is attributed to the presence of a binary companion or thermal dust emission. The percentage of stars with a significant excess increases with wavelength. The excess emission increases with wavelength and the largest excesses occur in stars of earlier spectral type. The near-IR excess colours are examined and compared to theoretical excess colours calculated from a simple bremsstrahlung emitting disc model with a radial density distribution of the form $\rho \propto r^{-\beta}$. The effect of model parameters on the excess colours is discussed. The observed excesses for the bulk of the stars are well fit by circumstellar discs with radii greater than 10 $R_\star$ and with a density index, β, in the range 2.0-5.0. This is very similar to the range of values previously determined by Waters et al. from *IRAS* far-IR observations. A small number of stars cannot be reconciled with discs with a constant density index out to 10 $R_\star$. It is argued that the

circumstellar plasma around these stars has a change in structure at 2-10 $R_\star$. The possibilities of disc truncation or a change in the density index as the cause of the structure change are discussed.

5.3. Tomographic Separation of Composite Spectra. III. UV Detection of the Hot Companion of Phi Persei

Michelle L. Thaller, William G. Bagnuolo, Jr., Douglas R. Gies, and Laura R. Penny
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We have used archival *IUE* high dispersion UV spectra of the Be binary Phi Per and published spectroscopic radial velocity curves to reconstruct the individual primary and secondary spectra using Doppler tomography. The primary's spectrum has rotationally broadened photospheric lines (consistent with a spectral type B0.5 III Ve) and narrow "shell" lines formed in its circumstellar disk. The recovered secondary spectrum (which contributes only 12% of the UV flux) has a very different appearance, with strong emission in C IV λ1550 and many narrow, weak absorption lines (mainly Fe V) similar to those found in the spectra of hot O-type subdwarfs. These results strongly support Poeckert's (1981) model in which the secondary is the stripped-down core of a once massive star.

5.4. Multicolor Polarimetry of Selected Be Stars: 1990-93

David McDavid
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Optical polarization data in the *UBVRI* filter system for eight bright northern Be stars are presented here as a continuation of a long-term monitoring project begun in 1984. There are no strong cases of night-to-night variability, and the only star showing unmistakable changes in polarization from year to year over the nine years covered by the program is Pi Aquarii. Even though the observed sample spans a wide range in spectral type, $v \sin i$, and degree of intrinsic polarization, the normalized wavelength dependence of the polarization is surprisingly similar for all of the stars. Analysis of the wavelength dependence of the variable polarization of Pi Aqr in terms of a simple equatorial disk model suggests that changes in the circumstellar electron number density alone may be sufficient to account for the observations, but it is not clear what real physical mechanism is involved.

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A Search for the Associations Near Southern Long-Period Cepheids .4. XY Carinae, GT Carinae, WZ Sagittarii, and SW Velorum
TURNER D.G. - VANDENBURGH S. - YOUNGER P.F. - DANKS T.A. - FORBES D.: APJS 85, 119 (1993)

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VALLERGA J.V. - VEDDER P.W. - WELSH B.Y.: APJ 414, L65 (1993)

7. MEETINGS

7.1. ASTROPHYSICAL APPLICATIONS OF STELLAR PULSATION

1995 February 6 - 10 (Mon - Fri)
Cape Town, SOUTH AFRICA

1. INTRODUCTION

Stellar pulsation is of fundamental importance to our understanding of the internal structure and atmospheres of stars and forms one of the cornerstones in the distance scale of the universe. This is one of a series of ongoing conferences in this topic and the first in the Southern Hemisphere. This conference promises to be especially interesting because of several recent advances in the field. The recent revision of opacities and other atomic data has completely changed our understanding of the nature of many pulsating stars and has greatly improved the diagnostic power of stellar pulsation. This became evident at the last pulsation meeting (Victoria, 1992) in which early successes in resolving longstanding problems were presented. The wider implications of the revised opacities are now even more apparent. Several reviews will explore these advances in the context of stellar evolution and the properties of several types of pulsating stars. Another area of rapid progress is the modelling of atmospheres in pulsating stars. This is a key step to our understanding of mass loss in these stars and the chemical enrichment of the interstellar medium. Photometric techniques, especially CCD photometry, have advanced to a stage which permits detailed studies of star clusters in the Magellanic Clouds, identification of variables in increasingly more distant galaxies and the search for pulsating stars with very low amplitudes in galactic clusters. Recent detections of large numbers of pulsation modes in white dwarfs, roAp, Delta Scuti and slowly-pulsating B stars have greatly increased the potential for using the pulsations as a probe of the internal structure of these stars. Finally, a variety of ground-based and spacecraft facilities such as HIPPARCOS, the Sydney University Stellar Interferometer and the MACHO project (to name only a few) are poised to provide new insights into the properties and processes in pulsating stars.

2. STRUCTURE OF THE MEETING

The conference will consist of a series of invited talks of 35-min duration followed by a 15-min discussion period. Poster papers are strongly encouraged; provision will be made for displaying these in a comfortable setting and adequate time will be made available for viewing them. The SOC is still considering the possibility of inviting a few oral presentations which are particularly relevant to the topic of the meeting, and which complement the invited reviews. This matter will be finalized in the coming months. The invited reviews, discussion and summaries of the poster papers will be included in the Proceedings. A preliminary list of invited speakers is included below.

A. Maeder (Switzerland):	Population I Stellar Structure and Evolution
C. Waelkens (Belgium):	Observations of Stellar Pulsation and Evolution
A. Gautschy (Germany):	New Developments in Pulsation Theory
P. Moskalik (Poland):	New Results on Pulsating OB Stars
D. Kurtz (South Africa):	Pulsating Ap Stars
M. Breger (Austria):	Asteroseismology of Delta Scuti Stars
R. Gilliland (USA):	Helioseismology
S. Kawaler (USA):	Pulsation and Evolution in Degenerate Stars
P. Wood (Australia):	Theory of Miras and OH-IR Stars
J. Chapman (Australia):	Observations of Miras and OH-IR Stars
P. Cottrell (New Zealand):	Yellow Supergiants and RCB Stars
P. Whitelock (South Africa):	Cool Stars and Galactic Structure
D. Fernie (Canada):	Cepheids, Related Stars, and Galactic Structure
C. Chiosi (Italy):	Population II Stellar Structure and Evolution
A. Walker (Chile):	The Population II Distance Scale
D. Welch (Canada):	Pulsating Stars in the Magellanic Clouds
J. Baldwin (UK):	Interferometry of Cool Pulsating Stars
R. Shobbrook (Australia):	The Sydney University Stellar Interferometer
C. Turon (France):	HIPPARCOS Data on Pulsating Stars
K. Cook (USA):	The MACHO Project and Pulsating Stars

3. VENUE; ACCOMMODATION

Cape Town is one of the prime tourist attractions of South Africa. The city, founded by Dutch settlers in 1652, nestles at the foot of Table Mountain (immortalized in the constellation of Mons Mensae). Perhaps the biggest attraction of the area is its scenic beauty. During the meeting there will be an opportunity for a half-day tour of the Cape Peninsula (Wednesday afternoon) which should not be missed. There are many other attractive tours which you may wish to arrange after the conference. It is also planned to provide a program for accompanying guests during the week of the conference. Full details will be made available later. The conference centre is located on the grounds of Valkenberg Hospital which is conveniently situated next door to the South African Astronomical Observatory. The weather in February is normally sunny and warm and you are invited to open-air lunches on the grounds of the SAAO during each day of the meeting. This will be included in your registration fee which is US $100.00 (early registration) or $120.00 (after 1 November). Registration forms will be E-Mailed to you in September. A musical evening will be held at the South African Museum on Monday. A tour of the museum is highly recommended. Plans for Tuesday evening include a traditional "braaivleis" (barbeque, cookout) on the grounds of the Observatory. The conference banquet will be held at the colonial-style Mount Nelson Hotel on Thursday evening. The price for the four-course meal (including drinks) is $30. Most delegates will be accomodated att the Breakwater Lodge in an area known as the Waterfront. This used to be an old prison which has been converted into a modern hotel. It is situated in the prime tourist area at harbour, and consists of a shopping mall and a large number of restaurants. The approxiamte prices are as follows: single room without bath - $25, with bath - $30, double without bath - $30, with bath - $40.

4. TRAVEL AND FUNDING

Most international flights arrive at Jan Smuts airport in Johannesburg. The internal flight to Cape Town takes approximately two hours. Of late, Cape Town has become an increasingly popular international destination and several major airlines now fly directly to Cape Town from Europe and the USA. The The carriers which offer direct flights include SAA (Amsterdam, London, Manchester, Miami, Paris, Milan, Munich, Frankfurt, Hamburg, Zurich), KLM (Amsterdam), BA (London), Air France (Paris), US Africa (Washington), Lufthansa (Frankfurt) and Swissair (Zurich). You are advised to contact your travel agent for the latest information. The airport is close to Cape Town; a 20-min taxi ride will take you to the Waterfront. Alternatively the airport bus will take you to the central railway station from where another bus will drop you off at the Waterfront. At the moment, visitors from most North American and European countries do not require visas to enter South Africa. This is subject to change and your are advised to contact the nearest South African consulate for the latest information. The SOC has applied for support for the meeting from the IAU. We are hopeful that this support will be forthcoming, but this decision will only be known in September. IAU funding is very limited and we ask you to obtain your own funds if at all possible. A small amount of money has been set aside by the LOC to assist those in greatest need. Please request funding only if you are certain that your existing funds will not be sufficient.

5. CONCLUSION

Registration forms will be mailed to you in September. A 3rd and final announcement will be sent in October or November. At that time SOC will know about IAU funding and can begin to distribute this money if it becomes available. If you require funding, you are advised to send an E-Mail abstract of your poster paper to assist the Chairperson of the SOC in distributing these funds. To assist the LOC in their preparation, we would be grateful if you could fill in the following form and send it by E-Mail to:

`pulsation@saao.ac.za`

NAME:

INSTITUTE:

POSTAL ADDRESS:

E-MAIL:

TELEX/FAX/TELEPHONE:

NUMBER OF PERSONS:

DO YOU REQUIRE FINANCIAL SUPPORT?
(If YES, please submit an abstract of your paper)

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8. NOTE TO SUBSCRIBERS

8.1. How to obtain the paper version of the Newsletter

The paper version of Volume 28 will be mailed to all current subscribers in early August, 1994. However, as a cost saving measure, **the paper version of subsequent volumes will only be mailed to libraries; individuals will receive only the electronic version unless we hear from you.** If you wish to continue receiving the paper version of the *Be Star Newsletter*, please contact me at the address below.

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