

Figure 2: CES spectrum of the star HR 14642. Some of the most prominent absorption lines are indicated. The star has a rotational velocity $v \text{ seni} = 18 \text{ km/sec}$.

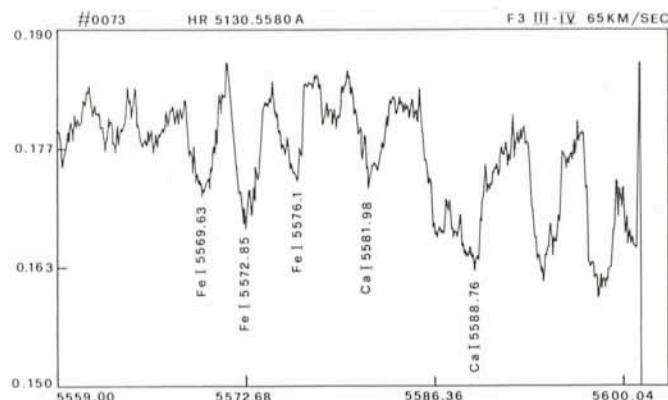


Figure 3: CES spectrum of the fast rotating star HR 5130 ($v \text{ seni} = 65 \text{ km/sec}$). The wavelength scale is the same as in Fig. 2.

of X-ray production. The number of F-type stars analyzed so far for rotational velocity is not large. To increase this number we observed a sample of 15 bright, X-ray emission stars at La Silla with the 1.4 m CAT telescope equipped with the CES.

Observations with the CAT

The rotational velocity of a star can be measured, following the classical procedure, from its broadening effect on the photospheric absorption lines, caused by the Doppler effect.

A simple cross correlation between the spectrum of the star to be measured and that of a template star was used to measure the observable quantity, namely $v \text{ seni}$ (v is the equatorial rotation velocity, i the angle between the rotation

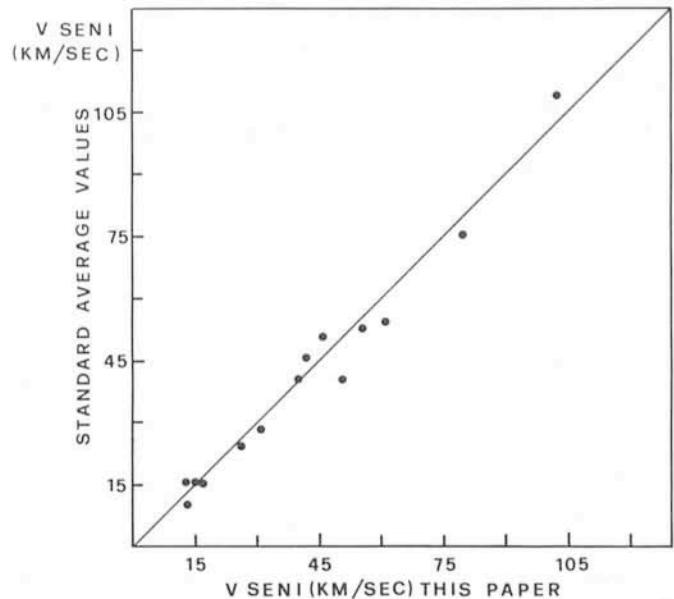


Figure 4: Rotational velocities calculated with the cross correlation method plotted versus weighted averages from other authors.

axis and the line of sight). The quality of the spectra is very high, with a resolution of about 80,000, as measured from a laser line. Figures 2 and 3 show two of the spectra obtained during the observations carried out in December 1983 and April 1984. The lines are well defined and the rotational broadening appears evident comparing the two spectra; the spectral region selected is the result of a compromise between the spectral sensitivity of the detector/spectrograph and the need to have several unblended lines of intermediate intensity.

To check our results we have observed, beyond the sample quoted above, 14 stars of known rotational velocity. The velocities obtained by us are plotted in Figure 4 versus the velocities obtained by other authors (weighted averages): the high accuracy of our results and the absence of a systematic deviation are remarkable.

Given the fact that our results appear to be among the best available so far, we are confident that the knowledge of the X-luminosity/ $v \text{ seni}$ relation will be improved. However, we have not yet all the available X-ray data. A comparison of the obtained $v \text{ seni}$ values with the spectral type confirms the results of previous observations (Fig. 1), both for main-sequence and giant stars. (It must be taken into account that seni can be very small for some stars.) A more extended project, which concerns a wider range of spectral types and includes also echelle spectra obtained at the Asiago Astrophysical Observatory, is under development.

Visiting Astronomers (October 1, 1985 – April 1, 1986)

Observing time has now been allocated for period 36 (October 1, 1985 – April 1, 1986). The demand for telescope time was again much greater than the time actually available.

The following list gives the names of the visiting astronomers, by telescope and in chronological order. The complete list, with dates, equipment and program titles, is available from ESO-Garching.

3.6 m Telescope

Oct. 1985: Kudritzki/Gehren/Husfeld/Hummer/Conti/Méndez/Niemela, Spite, M./Spite, F., Hunger/Heber, Brinks/

D'Odorico/Ponz, Bergeron/D'Odorico, Alloin/Pelat, Caputo/Castellani/Saraceno/De Stefanis, Brahic/Sicardy/Roques, Danks/Le Bertre/Chalabae/Bouchet, Danziger/Oliva/Moorwood, Moorwood/Oliva, Encrenaz/Lecacheux/Combes, Leinert/Dyck.

Nov. 1985: Leinert/Dyck, Marano/Zitelli/Zamorani, Röser/Meisenheimer, Butcher/Mighell/Oemler, Danziger/Rosa/Matteucci, Danziger/Gilmozzi/Kunth, Pizzichini/Pedersen, D'Odorico/Azzopardi/Lequeux/Prévot M.L., Rodono/Foing/Cutispoto/Scaltriti/Bonnet/Linsky/Butler/Haisch.

Dec. 1985: Swings/Gosset/Surdej, de Souza/Quintana, Lequeux/Azzopardi/Breysacher/Muratorio/Westerlund, Azzopardi/Gathier/Meysonnier, Schnur/Arp, Pakull/Angebault/Bianchi/Ilovaisky/Beuermann, Westerlund/Azzopardi/Breysacher/Rebeirot, Jörsäter/Lindblad/Athanassoula, Westerlund/Azzopardi/Breysacher/Rebeirot, Schnur/Schmidt-Kaler/Feitzinger, Balkowski/Boisson/Durret/Rocca Volmerange, Danks/Le Bertre/Chalabaev/Bouchet, Moneti/Natta/Stanga.

Jan. 1986: Moneti/Natta/Stanga, Bergeron/D'Odorico, Koester/Weidemann, Chmielewski/Jousson, Kudritzki/Simon/Méndez.

Feb. 1986: Pottasch/Mampaso/Manchado, Rosino/Ortolani, Ortolani/Gratton, Shaver/Cristiani, Heckman/Miley, Pickles/van der Kruit, D'Odorico/Clowes/Keable.

March 1986: Appenzeller/Östreicher, Dennefeld, Festou/Dennefeld, Véron, Danziger/Binette/Matteucci, Pottasch/Dennefeld/Karoji/Belfort, Courvoisier, Perrier/Encrenaz/Chelli/Colom, de Muizon/d'Hendecourt/Perrier, Preite-Martinez/Persi/Ferrari-Toniolo/Pottasch, Encrenaz/Lecacheux/Combes, Danks/Le Bertre/Chalabaev/Bouchet, Courvoisier, Pottasch/Bouchet/Karoji/Dennefeld/Belfort.

1.4 m CAT

Oct. 1985: Barbieri/Benacchio/Nota, Crivellari/Blackwell/Beckman/Arribas, Crivellari/Beckman/Foing, Heske/Wendker, Holweger/Steenbock, Foing/Bonnet/Crivellari/Beckman/Galleuillos/Lemaire/Gouttebroze.

Nov. 1985: Querci M./Querci F./Yerle/Bouchet, Foing/Bonnet/Crivellari/Beckman/Galleuillos/Lemaire/Gouttebroze.

Dec. 1985: Lindgren/Ardeberg/Maurice, Pallavicini/Pasquini, Waelkens, Pallavicini/Pasquini, Waelkens, Didelon, Waelkens, Gratton/Snedden, Waelkens, Gratton/Snedden.

Jan. 1986: Gratton/Snedden, Barbuy, Vidal-Madjar/Ferlet/de Grijp/Paresce, Ferlet/Vidal-Madjar/Lagrange, Ferlet/Vidal-Madjar/Gry/Laurent/Lallement, Lucy/Baade, Baade/Gathier, Barbieri/Benacchio/Cristiani/Nota, Gillet.

Feb. 1986: Gillet, Lindgren/Ardeberg/Maurice, Gustafsson/Andersen/Edvardsson/Nissen.

March 1986: Cayrel de Strobel, Stalio/Porri, Ruiz/Melnick/Ortiz, Arpigny/Dossin/Manfroid, Danks/Chalabaev/Zuiderwijk/Lambert.

2.2 m Telescope

Oct. 1985: Danziger/Focardi, Jakobsen/Perryman/Blades, Courvoisier/Fosbury/Harris/Gry, Colina/Perryman/Kollatschny, Rafanelli/Schulz/di Serego Alighieri, Chiosi/Bertelli/Ortolani/Gratton, Danziger/Fosbury/Tadhunter.

Dec. 1985: Butcher/Gathier/Buonanno/Mighell, Fusi Pecci/Buonanno/Corsi/Renzini, Pizzichini/Pedersen, Cristiani/Nota, Jörsäter/Lindblad/Athanassoula, Franz/Illingworth.

Jan. 1986: Bottema/van der Kruit, Monnet/Bacon/Martinet, Gathier/Kwitter, Paresce/Vidal-Madjar/de Grijp, Perryman/van Heerde, van Heerde/de Grijp/Lub, Weigelt/Baier/Koller/Kollatschny/Nota.

Feb. 1986: Weigelt/Baier/Koller/Kollatschny/Nota, Jörgenssen/Hansen/Norgaard-Nielsen/de Jong, Reipurth, Weigelt/Baier/Koller/Kollatschny/Nota.

March 1986: Pottasch/Dennefeld/Karoji/Belfort, Brand/Wouterloot.

1.5 m Spectrographic Telescope

Oct. 1985: Seggewiss/Nelles, Alloin/Pelat, Bues/Rupprecht/Pragal, Gry/Vauclair, Gomez/Gerbaldi/Floquet/Grenier.

Nov. 1985: Gomez/Gerbaldi/Floquet/Grenier, v. Amerongen/v. Paradijs/Pakull/Pietsch, Fricke/Hellwig, Alloin/Pelat, Hahn/Lagerkvist/Rickman, Crivellari/Beckman/Foing, Schober/Albrecht, Labhardt.

Dec. 1985: Labhardt, Schoembs/Haefner/Barwig/Mantel/Marschhäuser, Heydari-Malayeri/Testor, Ruiz/Rubio/Pena, Lub/de Ruiter, Schoembs/Haefner/Barwig/Mantel/Marschhäuser, Thé/Westerlund/Pérez.

Jan. 1986: Thé/Westerlund/Pérez, Richtler/Seggewiss, Maciel/Barbuy/Aldrovandi/Faundez-Abans, Lindgren/Ardeberg/Maurice/Prévot L., Rampazzo, Acker/Stenholm/Lundström, Bässgen/Grewig/Krämer/Maluck, Vernin/Azouit.

Feb. 1986: Vernin/Azouit, Strupat/Drechsel/Haug/Böhnhhardt/Rädlein/Rahe, Vernin/Azouit, Thé, Jorissen/Arnould.

March 1986: Jorissen/Arnould, Lagerkvist/Rickman/Hahn/Magnusson, Schneider/Maitzen/Catalano F., Metz/Haefner/Roth, Arpigny/Dossin/Manfroid, Stanga/Falciani/Moneti/Tozzi, Arpigny/Dossin/Manfroid, de Vries J.S.

1 m Photometric Telescope

Oct. 1985: Clementini/Cacciari/Prévot L./Lindgren, Bues/Rupprecht/Pragal, Liller/Alcaino, Bues/Rupprecht/Pragal, Heske/Wendker, Oliva.

Nov. 1985: Oliva, Encrenaz/Lecacheux/Combes, Beuermann/Pakull/Schwoppe/Pietsch, Motch/Mouchet/Bonnet-Bidaud/Watts, Arlot/Thuillot/Morando/Lecacheux, Motch/Mouchet/Bonnet-Bidaud/Watts, Rodono/Foing/Cutispoto/Scaltriti/Bonnet/Linsky/Butler/Haisch, Hahn/Lagerkvist/Rickman, Crivellari/Beckman/Foing.

Dec. 1985: Crivellari/Beckman/Foing, Danks/Le Bertre/Chalabaev/Bouchet, Trefzger/Labhardt/Spaenhauer/Steinlin, Schoembs/Haefner/Barwig/Mantel/Marschhäuser, Thé/Westerlund/Pérez, Danks/Le Bertre/Chalabaev/Bouchet.

Jan. 1986: Bouvier/Bertout, Richtler, Mermilliod/Claria, Vogt.

Feb. 1986: Vogt, Barwig/Dreier/Haefner/Mantel/Schoembs, Reipurth, Thé, Lagerkvist/Rickman/Hahn/Magnusson.

March 1986: Lagerkvist/Rickman/Hahn/Magnusson, Schneider/Maitzen/Catalano F., Jockers/Geyer/Hänel/Nelles, Hänel/Geyer/Jockers, Pakull/Beuermann/Weißsieker/Reinsch, Stanga/Natta/Moneti/Lenzuni, Stanga/Falciani/Moneti/Tozzi, Danks/Le Bertre/Chalabaev/Bouchet, Persi/Preite-Martinez/Ferrari-Toniolo.

50 cm ESO Photometric Telescope

Oct. 1985: Grenon/Grewing/Scales, Gustafsson/Morell/Edwards-Son, Grenon/Grewing/Scales, Arlot/Thuillot/Morando/Lecacheux, Grenon/Grewing/Scales, Arlot/Thuillot/Morando/Lecacheux, Grenon/Grewing/Scales, Gutekunst/Grewing/Bässgen/Kappelmann/Bianchi, Arlot/Thuillot/Morando/Lecacheux, Gutekunst/Grewing/Bässgen/Kappelmann/Bianchi.

Nov. 1985: Gutekunst/Grewing/Bässgen/Kappelmann/Bianchi, Arlot/Thuillot/Morando/Lecacheux, Hahn/Lagerkvist/Rickman, Rodono/Foing/Cutispoto/Scaltriti/Bonnet/Linsky/Butler/Haisch, Arlot/Thuillot/Morando/Lecacheux, Rodono/Foing/Cutispoto/Scaltriti/Bonnet/Linsky/Butler/Haisch, Hahn/Lagerkvist/Rickman.

Dec. 1985: Hahn/Lagerkvist/Rickman, Pedersen/Angebault/Cristiani/Danziger/Gouffes/Hurley/Lund/Motch/Pietsch/Pizzichini/Poulsen/Rieger.

Jan. 1986: Pedersen/Angebault/Cristiani/Danziger/Gouffes/Hurley/Lund/Motch/Pietsch/Pizzichini/Poulsen/Rieger, Roddier C./Roddier F.

Feb. 1986: Roddier C./Roddier F., Thé, Schneider/Maitzen.

March 1986: Schneider/Maitzen, Kohoutek/Schramm/Kleine, Metz/Haefner/Roth, Carrasco/Loyola, Manfroid/Sterken/Arpigny.

GPO 40 cm Astrograph

Oct. 1985: Richter/Russell, Tucholke.

Feb. 1986: Debehogne/Machado/Caldeira/Vieira/Netto/Zappala/De Sanctis/Lagerkvist/Mourao/Tavares/Nunes/Proftitch-Benishek/Bezerra, Richter/Russell.

March 1986: Ferreri/Zappala/Di Martino/De Sanctis.

1.5 m Danish Telescope

Oct. 1985: Clementini/Cacciari/Prévet L./Lindgren, de Vries C.P./Le Poole, Martinet/Bacon, Brinks/Klein/Dettmar/Danziger/Matteucci, Bosma/Athanassoula, Boisson/Ward, Thomsen et al.

Nov. 1985: Thomsen et al., Walker/Andersen/Storm.

Dec. 1985: v. Paradijs/v.d. Klis, Pedersen, de Souza/Quintana, Pakull/Angebault/Bianchi/Ilovaisky/Beuermann, Heydari-Malayeri/Testor, Bonnet-Bidaud/Gry, de Grijp/Lub/Miley, Hansen.

Jan. 1986: Hansen, Reiz/Pirola, Lindgren/Ardeberg/Maurice/Prévet L., Andersen/Nordström/Olsen.

Feb. 1986: Andersen/Nordström/Olsen, Mayor/Duquennoy/Andersen/Nordström, Mayor/Mermilliod, Hermsen/Pedersen/Spoelstra, Lindgren/Ardeberg/Maurice/Prévet L., Andersen/Nordström, Thomsen et al.

March 1986: Thomsen et al., Reipurth, Andersen/Nordström.

50 cm Danish Telescope

Oct. 1985: v. Paradijs/Henrichs/Trachet, Foing/Bonnet/Crivellari/Beckman/Galleguillos/Lemaire/Gouttebroze.

Nov. 1985: Foing/Bonnet/Crivellari/Beckman/Galleguillos/Lemaire/Gouttebroze, Group for Long Term Photometry of Variables.

Dec. 1985: Group for Long Term Photometry of Variables.

Jan. 1986: Group for Long Term Photometry of Variables, Lindgren/Ardeberg/Maurice/Prévet L.

Feb. 1986: Lindgren/Ardeberg/Maurice/Prévet L., Group for Long Term Photometry of Variables.

March 1986: Group for Long Term Photometry of Variables.

90 cm Dutch Telescope

Oct. 1985: Gautschy, Courvoisier/Fosbury/Harris/Gry, v. Amerongen/v. Paradijs/Pakull/Pietsch, Pel/de Jong A.

Nov. 1985: Pel/de Jong A.

Dec. 1985: v. Amerongen/v. Paradijs, Lub/de Ruiter, Greve/Georgelin/Laval/van Genderen, Lub/de Ruiter, van Genderen/van Driel.

Jan. 1986: Grenon/Lub.

Feb. 1986: Grenon/Lub, de Zeeuw/Lub/de Geus/Blaauw.

61 cm Bochum Telescope

Oct. 1985: Kieling, Rudolph.

Nov. 1985: Rudolph.

Dec. 1985: Rudolph, Schmidt-Kaler.

Jan. 1986: Thé/Westerlund/Pérez, Schober/Albrecht, Lodén K.

Feb. 1986: Lodén K., Strupat/Drechsel/Haug/Böhnhardt/Rädelein/Rahe, Celnik, Koczet.

List of ESO Preprints (June–August 1985)

374. J. Melnick, R. Terlevich and M. Moles: Near Infrared Photometry of Violent Star Formation Regions. *Revista Mexicana de Astronomía y Astrofísica*. July 1985.
375. A. Tornambè and F. Matteucci: Mass Limit for e-capture Supernovae and Chemical Evolution of Galaxies. *Astronomy and Astrophysics*. July 1985.
376. S. D'Odorico, M. Pettini and D. Ponz: A Study of the Interstellar Medium in Line to M83 from High Resolution Observations of the Nucleus and Supernova 1983n. *Astrophysical Journal*. July 1985.
377. G. Contopoulos and B. Barbanis: Resonant Systems of Three Degrees of Freedom. *Astronomy and Astrophysics*. July 1985.
378. P. Bouchet, J. Lequeux, E. Maurice, L. Prévet and M.-L. Prévot-Burnichon: The Visible and Infrared Extinction Law and the Gas to Dust Ratio in the Small Magellanic Cloud. *Astronomy and Astrophysics*. July 1985.
379. B. Sicardy et al.: Variations of the Stratospheric Temperature along the Limb of Uranus: Results of the 22 April 1982 Stellar Occultation. *Icarus*. July 1985.
380. J. Dachs et al.: Measurements of Balmer Emission Line Profiles for Southern Be Stars. III. New Data and Radial Velocities. *Astronomy and Astrophysics Suppl.* July 1985.
381. C. Barbieri and S. Cristiani: Quasar Candidates in the Field of S.A. 94 ($2^h 53^m + 0^\circ 20'$). *Astronomy and Astrophysics Suppl.* July 1985.
382. J. Surdej: Analysis of P Cygni Line Profiles: Generalization of the n^{th} Order Moment W_n . *Astronomy and Astrophysics*. July 1985.
383. G. Chincarini and R. de Souza: Optical Studies of Galaxies in Clusters: I. Observations of Hydrogen Deficient Galaxies. *Astronomy and Astrophysics*. July 1985.
384. E.J. Wampler and D. Ponz: Optical Selection Effects that Bias Quasar Evolution Studies. *Astrophysical Journal*. August 1985.
385. J. Melnick, M. Moles and R. Terlevich: The Super Star Cluster in NGC 1705. *Astronomy and Astrophysics Letters*. August 1985.
386. J. Melnick: The 30 Doradus Nebula: I. Spectral Classification of 69 Stars in the Central Cluster. *Astronomy and Astrophysics*. August 1985.
387. R.A.E. Fosbury: Large Scale Ionized Gas in Radio Galaxies and Quasars. Invited paper at "Structure and Evolution of Active Galactic Nuclei". Trieste, April 10–13, 1985. August 1985.
388. G. Vettolani, R. de Souza and G. Chincarini: Isolated Galaxies. *Astronomy and Astrophysics*. August 1985.
389. M.-H. Ulrich et al.: Discovery of Narrow and Variable Lines in the Ultraviolet Spectrum of the Seyfert Galaxy NGC 4151, and an Outline of Our Previous Results. Invited paper at "Structure and Evolution of Active Galactic Nuclei". Trieste, April 10–13, 1985. August 1985.
390. R.H. Sanders: Finite Length-Scale Anti-Gravity and Observations of Mass Discrepancies in Galaxies. *Astronomy and Astrophysics*. August 1985.