

INTERNAL BOUNDARY LAYER

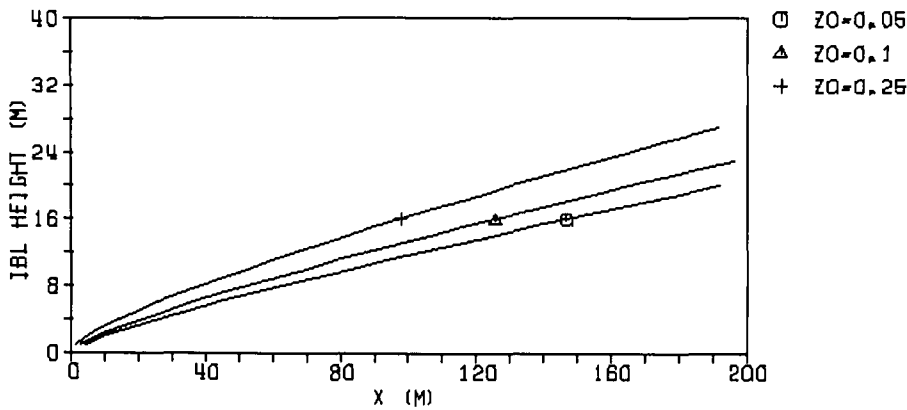


Figure 3: Height of the internal boundary layer as a function of fetch x for different values of roughness length z_0 .

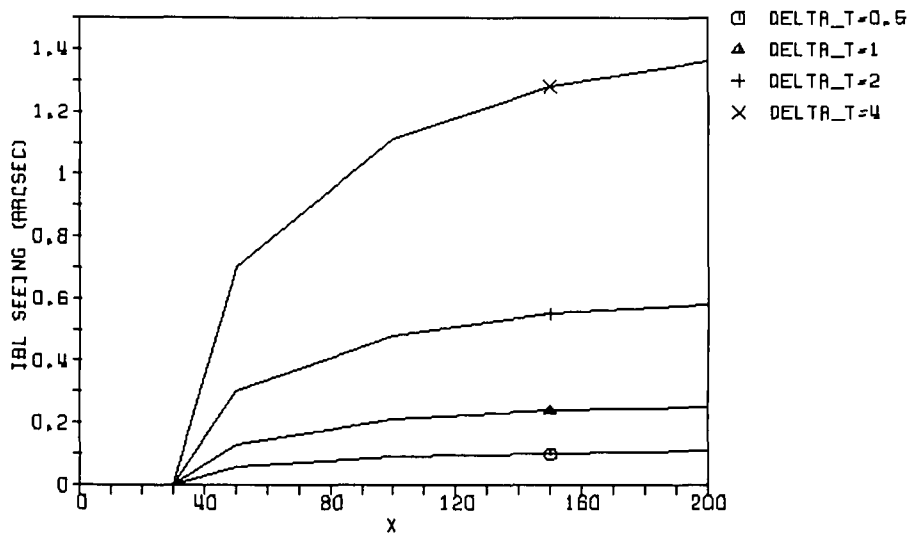


Figure 4: Seeing in the IBL (integrated from 5 m to the top of the IBL along a vertical line) as a function of fetch x for different values of $\Delta\theta_s$. Note that there are no IBL effects until about 30 m from the edge where the height of the IBL reaches 5 m.

and a few hedges) and $z_0 = 0.25$ m (many hedges, a few structures).

Very approximately, velocity profiles below and above δ are logarithmic with different slopes so that a kink appears at δ . From the condition of continuity across the IBL interface one can compute the local friction velocity u_{IBL}^2 , ob-

taining then $\frac{d\theta}{dz}$ from (4). The vertical heat flux in the IBL is assumed constant and equal to the average air-surface flux:

$$q(z) = q_s = C_H U \Delta\theta_s = \frac{u_{IBL}^2}{U^2} U \Delta\theta_s \quad (8)$$

where $\Delta\theta_s$ is the potential temperature difference between the top of the IBL

and the ground, while C_H is the bulk heat transfer coefficient, here assumed to be equal to the momentum transfer coefficient for a turbulent boundary layer.

One has now all the inputs for a C_T^2 model in the IBL.

Figure 1 shows the vertical C_T^2 profile computed for $\kappa = 50, 100$ and 150 m, assuming $z_0 = 0.1$ m and $\Delta\theta_s = 1^\circ$: the C_T^2 values in the IBL are in this case about one order of magnitude greater than in the free wind flow. However, because of the short integration path, the high C_T^2 does not necessarily result in an unacceptable seeing contribution, as one can see from Figure 4. Only in case of a strong ground cooling, the IBL seeing becomes relatively large.

4. Conclusions

While it should be reminded that the results computed with this simple model of C_T^2 cannot claim any absolute accuracy, it is nonetheless possible to draw some conclusions from the comparison of different situations.

The height and turbulence of the IBL are dependent on the average roughness of the surface, which a good design should therefore try to minimize, by avoiding raised structures and any kind of obstacles likely to contribute to the turbulence generated locally. However, the stronger effect on the IBL seeing will likely be caused by temperature differences between the ground and the incoming flow: this difference will have to be minimized by selecting surface materials which are lightweight and of low conductivity: for instance porous gravel should be used rather than solid rock. In this way the heat flux through the ground will be reduced and the thermal time constant of the surface will be correspondingly decreased.

In a next article, we will discuss the possible seeing effects in the wake of other structures, which is another important aspect of the design of a multi-telescope observatory.

Visiting Astronomers

(April 1–October 1, 1990)

Observing time has now been allocated for Period 45 (April 1–October 1, 1990). 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 programme titles, is available from ESO-Garching.

3.6-m Telescope

April: Butcher/Slingerland/Pottasch E./

Baade/Christensen-D./Frandsen, Boulanger/Falgarone/Gérin/Harmon, Ögelman/Gouiffes/Melnick/Augustejjn/Hasinger/Pietsch, Danziger/Bouchet/Gouiffes/Lucy/Wampler/Fransson/Mazzali, Turatto et al. (4-004-45K), Chincarini/Buzzoni/Molinari, di Serego Alighieri/Fosbury/Quinn/Schlötelburg/Tadhunter, Reimers/Koester, Tammann/Leibundgut/Stein.

May: Sackett/Jarvis, Magazzù/Strazzulla, Moorwood/Oliva, Hensberge et al. (5-005-45K), Baade/Crane, Reipurth/Dubath/Mayor, Ehrenfreund/Leger/Foing, Möllenhoff/Madejsky, Bertola et al. (1-008-43K), Shaver, Melnick/Gopal-Krishna/Steppe/Giraud, Danziger/Bouchet/Gouiffes/Lucy/Wampler/Fransson/Mazzali.

June: Leinert/Haas, Perrier/Mariotti/Mayor/Duquenooy, Danziger/Bouchet/Gouiffes/Lucy/Wampler/Fransson/Mazzali, Turatto et al. (4-004-45K), Epchtein/Le Bertre/Blommaert/van Langevelde/Nguyen-Quang-R./Winnberg/Lindquist/Habing, Ferlet/Vidal-Madjar/Dennefeld, Rosa/Mathis, Pottasch S.R./Manchado/Garcia Lario/Sahu K.C.

July: Käufel/Stanghellini/Renzini, Lagrange-Henri/Maillard/Vidal-Madjar/Gry/de Muizon/Ferlet/Beust, Glass/Moorwood/Moneti, Danziger/Bouchet/Gouiffes/Lucy/Wampler/Fransson/Mazzali, Turatto et al. (4-004-45K), Sicardy/Brahic/Barucci/Ferrari/Fulchignoni/Roques, Habing et al. (5-004-45K), Dettmar/Shaw/Klein, Cappellaro/Held/Capaccioli, Held/Cappellaro/Capaccioli, Bertola/de

Zeeuw/Zeilinger, Danziger/Bouchet/Gouiffes/Lucy/Wampler/Fransson/Mazzali, Turatto et al. (4-004-45K), Morganti/Tadhunter/di Serego Alighieri/Fosbury/Danziger, Nota/Greenfield/Clampin/Paresce.

August: Neri/Grewing/Bässgen M., Bender et al. (1-004-43K), Webb/Carswell/Shaver, Wampler et al. (2-010-45K), Dubath/Melnick/Mayor, Danziger/Bouchet/Gouiffes/Lucy/Wampler/Fransson/Mazzali.

September: Molaro/Castelli/Bonifacio, Borra/Sanvico/Cristiani/Levesque/Shaver, Mazure et al. (1-014-43K), Rhee et al. (1-005-43K), de Lapparent et al. (1-003-43K), Marano/Held/Cappi, Danziger/Bouchet/Gouiffes/Lucy/Wampler/Fransson/Mazzali, Turatto et al. (4-004-45K), Ögelman/Gouiffes/Melnick/Augustejn/Hasinger/Pietsch.

3.5-m NTT

May: Jarvis, Danziger/Bouchet/Gouiffes/Lucy/Wampler/Fransson/Mazzali, Pollacco/Houziaux/Manfroid/Hill, Buonanno/Fusi Pecci/Richer/Fahlmann/Ferraro, Surdej et al. (2-003-43K), Ortolani/Renzini/Rosino.

July: Richtler/Wagner/Held/Capaccioli, Danziger/Bouchet/Gouiffes/Lucy/Wampler/Fransson/Mazzali, Piotto/Djorgovski, Zinnecker/Moneti/Rosa, Walton/Barlow/Walsh/Clegg, Aurière/Koch Miramond/Ilovaisky/Chevalier/Lauzeral.

August: Meylan/Djorgovski/Shaver/Weir, Bender et al. (1-004-43K), Surdej et al. (2-003-43K).

September: Miley et al. (2-001-43K), Danziger/Bouchet/Gouiffes/Lucy/Wampler/Fransson/Mazzali, Bergeron et al. (1-012-43K).

2.2-m Telescope

April: Danziger/Bouchet/Gouiffes/Lucy/Wampler/Fransson/Mazzali, Turatto et al. (4-004-45K), v.d. Hucht/Thé/Williams, Test-Moorwood, Moneti/Zinnecker/Reipurth, Dougados/Rouan/Léna, (Bernard/Loup/Giard), Moeller/Kjaergaard, Surdej et al. (2-003-43K), Reinsch/Pakull/Festou/Beuermann/Burwitz, Sackett/Jarvis, Hutsemekers/van Drom, Reinsch/Pakull/Festou/Beuermann/Burwitz, Hutsemekers/van Drom.

May: MPI time.

June: Test-Moorwood, Epchtein/Le Bertre/Blommaert/v. Langevelde/Nguyen-Quang-R./Winnberg/Lindquist/Habing, Hopfensitz/Grewing, (Ehrenfreund/Käufel), (Foing/d'Hendecourt), Reinsch/Pakull/Festou/Beuermann/Burwitz, Richtler/Kaluzny, Alcaíno/Liller/Alvarado/Wenderoth, Spaenhauer/Labhardt, Glass/Moorwood/Moneti.

July: Glass/Moorwood/Moneti, Wink/Greve, v.d. Veen/Blommaert/Habing, Danziger/Bouchet/Gouiffes/Lucy/Wampler/Fransson/Mazzali, Turatto et al. (4-004-45K), Dettmar/Shaw/Klein, Tosi/Focardi/Greggio/Marconi, Bertola/de Zeeuw/Zeilinger, Longo/Capaccioli/Busarello/Di Martino F., Morganti/Tadhunter/di Serego Alighieri/Fosbury/Danziger.

August: Test-Moorwood, (v.d. Kruit/de Jong R.S.), Danziger/Bouchet/Gouiffes/Lucy/Wampler/Fransson/Mazzali, Turatto et al. (4-004-45K), Gustafsson/Eriksson/Olofsson/Lambert/Paresce, Surdej et al. (2-003-

Announcement

12th European Regional Astronomy Meeting

of the International Astronomical Union (IAU)

EUROPEAN ASTRONOMERS LOOK TO THE FUTURE

8–11 October 1990, Davos, Switzerland

organized jointly with the Astronomy and Astrophysics Division of the European Physical Society (EPS)

with support from the European Space Agency (ESA) and the European Southern Observatory (ESO)

Meeting Objectives

The 12th European Regional Astronomy Meeting (ERAM) of the International Astronomical Union (IAU) is a general astronomy meeting covering all fields of astronomy: solar system, stellar, galactic and extragalactic astronomy as well as cosmology. The theme *European Astronomers look to the Future* reflects the positive outlook for ground-based and space astronomy throughout Europe and the new opportunities for Europe-wide cooperation.

Programme Concept

The meeting will be divided into plenary and poster sessions. Forward-looking reviews of active scientific areas in astronomy, a few brief reports on particularly exciting unpublished discoveries as well as a brief review of instrument projects and long-range plans in the form of a panel discussion will be scheduled for plenary sessions. Poster sessions will be devoted to contributed papers grouped according to subjects and in most cases accompanied by discussion sessions. In addition, prospective and very recent PhDs will be given ample opportunity to present their work in a separate oral session.

Venue and Timing

The meeting will be held in the Kongresszentrum, Davos, Switzerland from 8 to 11 October 1990. The meeting will start in the early afternoon of Monday, 8 October, and will end around noon on Thursday, 11 October, to facilitate travel on those days.

Davos, located in the canton of Grisons, can easily be reached by train or car from many countries in Europe and is a three-hour train journey from Zurich airport.

Accommodation

Favourable hotel rates, and very cheap pension accommodation will be available for participants.

Meeting Language

All sessions will be conducted in English.

Special Considerations

It is expected that at least partial support may be granted to deserving young astronomers. Ways to facilitate the participation of astronomers from countries with monetary exchange difficulties are being studied.

Scientific Organizing Committee

J. Bergeron, IAU representative, Paris
A. A. Boyarchuk, Moscow
C. Chiuderi, Arcetri
K. Fredga, Solna
B. Kovachev, Sofia
M. C. E. Huber, EPS representative, Noordwijk
R. Lüst, ESA, Paris
H. van der Laan, ESO, Garching
P. Léna, Meudon
F. Sánchez, Tenerife
J. P. Swings, Liège
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L. Woltjer, St.-Michel-l'Observatoire, Chairman

Swiss Organizing Committee

P. Bochslers, Bern
T. Courvoisier, Genève
C. Fröhlich, Davos
B. Hauck, Lausanne
U. W. Steinlin, Basel, Chairman
J. O. Stenflo, Zürich

Contact Address

To receive the second announcement, which will contain the outline of the programme, an invitation to submit contributed papers, and forms for hotel reservations, funding applications, and registration instructions, please contact:

Professor U. W. Steinlin
Astronomisches Institut
der Universität Basel
Venusstraße 7
CH-4102 Binningen
Switzerland

Calendar

15 April	Second Announcement
15 July	Deadline for return of registration form, hotel reservations, support applications
31 August	Deadline for abstracts of contributed papers
21 Sept.	Final programme to participants
8 October	Abstract booklet

43K), Barbieri et al. (2-007-43K), Bender et al. (1-004-43K).

September: MPI time.

1.5-m Spectrographic Telescope

April: Calvani/Marziani, Courvoisier/Bouchet/Blecha, Acker/Jasniewicz/Duquenooy, Pollacco/Walsh/Tadhunter/Hill, Sivan/Perrin.

May: Renzini/Greggio/Bragaglia, Gerbaldi et al. (5-004-43K), Hutsemekers/van Drom, Bica/Prugniel/Alloin, Paturel et al. (1-017-45K).

June: Paturel et al. (1-017-45K), Bässgen M./Grewing/Diesch, Hron, Greve/McKeith, Courvoisier/Bouchet/Blecha, Polcaro/Giovannelli/Manchanda/Norci/Pollock/Rossi/Viotti, Acker/Stenholm/Lundström, Pottasch S.R./Manchado/Garcia Lario/Sahu K.C.

July: Augusteijn, Gehren/Axer/Fuhrmann/Steenbock/Reile, Longo/Capaccioli/Busarello/Di Martino F., Habing et al. (5-007-45K), Andreae/Drechsel, Walsh/Pottasch S.R./Walton.

August: Ramella/Focardi/Geller, Schmitt/Pasquini, Barbieri et al. (2-007-43K).

September: Gerbaldi et al. (5-004-43K), Rafanelli/Schulz H./Marziani, Falomo/Marascchi/Tanzi/Treves, Bettoni/Bertola/Buson, Claudi/Bianchini/Friedjung/Sabbadin.

1.4-m CAT

April: North, Pottasch S.R./Sahu K.C., Gratton/Snedden, Gratton/Gustafsson/Eriksson, Mauron, Pasquini.

May: Pasquini, Westerlund/Krelowski, Pasquini/Spite M./Restaino, Hutsemekers/van Drom, Gredel/v. Dishoeck/Black, Gredel/v. Dishoeck/Black, Crane/Palazzi/Mandolesi, da Silva/de la Reza/Dore.

June: Wilson/Henkel/Stahl, Gosset/Vreux, Greve/Keenan/Dufton, Boffin/Arnould/Forestini/Isern/Canal/Rebolo/Abia, Holweger/Lemke.

July: Lagrange-Henri/Ferlet/Vidal-Madjar/Beust, Vladilo/Molaro/Centurion/Monai, Cuypers/Waelkens, Benvenuti/Porceddu, François.

August: Andersen/Gustafsson/Saar/Zwaan, Gustafsson/Eriksson/Olofsson/Lambert/Paresce, Van Kerkwijk/Waters/Verbunt/van Paradijs/Coté/Pols/v. d. Heuvel.

September: Crane/Blades/Penprase, Kürster/Schmitt/Cutispoto/Fleming/Dennerl, Kürster/Schmitt/Cutispoto/Fleming/Dennerl, Lagrange-Henri/Ferlet/Vidal-Madjar/Beust, Foing/Jankov/Char/Martic/Doyle/Neff.

1-m Photometric Telescope

April: de Jong/Hu/Slijkhuis, Persi/Origlia/Ferrari-Toniolo, v.d. Hucht/Thé/Williams, Baudzus/Schmidt-Kaler/Hanuschik/Demmer, Courvoisier/Bouchet/Blecha, Sterken/Longo/Busarello, Reinsch/Pakull/Festou/Beuermann/Burwitz.

May: Reinsch/Pakull/Festou/Beuermann/Burwitz, Pottasch S.R./Manchado/Garcia Lario/Sahu K.C., Courvoisier/Bouchet/Blecha, Prugniel/Bica/Alloin, Augusteijn/Nather/Winget.

June: Nyman/Le Bertre/Hall/Norris, Le Bertre et al. (5-006-45K), Courvoisier/Bouchet/Blecha, Giard/Bernard/Dennefeld/

Perault/Sales, Munari/Whitelock/Massone, Terzan.

July: Le Bertre et al. (5-006-45K), Sicardy/Brahic/Barucci/Ferrari/Fulchignoni/Roques, Courvoisier/Bouchet/Blecha, Liller/Alcaino/Alvarado/Wenderoth, Di Martino M./Pirronello/Mantegazza, Habing et al. (5-007-45K).

August: Habing et al. (5-007-45K), Nieto/Davoust/Poulain/Bender/Capaccioli/Prugniel, Weiss/Schneider/Kuschnig/Rogl, Schmitt/Pasquini.

September: van Kerkwijk/Waters/Verbunt/van Paradijs/Coté/Pols/van den Heuvel, Schneider/Weiss/Kuschnig/Rogl, Schmitt/Pasquini, Di Martino M./Zappalà/Cellino/Farinella/Davis, Foing/Jankov/Char/Martic/Doyle/Neff.

50-cm Photometric Telescope

April: Antonello/Mantegazza/Poretti/Riboni, Kohoutek.

May: Kohoutek, Franchini/Alcalà/Chavarría/Terranegra/Covino/Ferluga/Stalio/Pasquini.

June: Drechsel/Lorenz/Mayer.

July: Sinachopoulos.

August: Debehogne/Di Martino M./Zappalà/Lagerkvist/Hahn/Magnusson/De Campos/Cuypers/Cutispoto.

September: Kürster/Schmitt/Cutispoto/Fleming/Dennerl, Foing/Jankov/Char/Martic/Doyle/Neff.

GPO 40-cm Astrograph

June: Aniol/Duerbeck/Tsvetkov/Tsvetkova.

July: Aniol/Duerbeck/Tsvetkov/Tsvetkova.

September: Debehogne/Machado/Mouroa/Caldeira/Vieira/Netto/Zappalà/De Sanctis/Lagerkvist/Protitch-B./Javanshir/Woszczyk.

1.5-m Danish Telescope

April: Lindgren H./Ardeberg/Lundström, Ardeberg/Lundström/Lindgren H., Brocato/Caputo/Castellani, Chevalier/Ilovaisky/Pedersen, Miller/Ballard, Mazure et al. (1-014-

43K), Rhee et al. (1-005-43K), Pollacco/Walsh/Tadhunter/Hill.

May: Pollacco/Walsh/Tadhunter/Hill, Andersen/Nordström/Mayor/Olsen, Nordström/Andersen, Danish time.

June: Lindgren H./Ardeberg/Lundström, Ardeberg/Lundström/Lindgren H., Cacciari/Ferraro/Fusi Pecci/Stanghellini/Oculi/Tessicini, Ortolani/Barbuy/Bica, Cacciari/Ferraro/Fusi Pecci/Stanghellini/Oculi/Tessicini, Erskens/Wagner.

July: Danish time.

August: Mayor et al. (5-001-43K), Surdej et al. (2-003-43K), Danziger/Bouchet/Gouiffes/Lucy/Wampler/Fransson/Mazzali, Barbieri et al. (2-007-43K), Azzopardi/Lequeux/Rebeiro, Bender et al. (1-004-43K), Mayor et al. (5-001-43K).

September: Mayor et al. (5-001-43K), Lindgren H./Ardeberg/Lundström, Danish time.

50-cm Danish Telescope

April: Danish time, Ardeberg/Lundström/Lindgren H.

May: Danish time, Ardeberg/Lundström/Lindgren H., Lampens/Dommanget.

June: Lampens/Dommanget, Group for Long Term Photometry of Variables.

July: Group for Long Term Photometry of Variables.

August: Group for Long Term Photometry of Variables.

September: Group for Long Term Photometry of Variables.

90-cm Dutch Telescope

April: de Vries C.P./v. Dishoeck/Blades/Penprase, Martin W./Kohoutek.

May: Martin W./Kohoutek, Dutch time.

June: Dutch time, van Genderen/v.d. Hucht, van Genderen.

July: van Genderen/v.d. Hucht, van Genderen, Dutch time.

August: Dutch time, van Genderen/v.d. Hucht, van Genderen, de Vries C.P./v. Dishoeck/Blades/Penprase.

September: de Vries C.P./v. Dishoeck/Blades/Penprase, Dutch time.

The ESO USERS MANUAL Version 1990 Now Available!

The long awaited new version of the ESO Users Manual has just been delivered by the printer and will be distributed during the second half of March.

If your Institute has not received a copy, please write to the

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ESO Headquarters
Karl-Schwarzschild-Str. 2
D-8046 Garching bei München
F.R. Germany.

