

TABLE OF CONTENTS

Preface	.....	xv
Organizing committees	.....	xvii
List of participants.	.....	xix

INTRODUCTION

An overview of helio- and asteroseismology. J. Christensen-Dalsgaard.	3
---	-------	----------

1. OBSERVATIONS OF SOLAR OSCILLATIONS

Helioseismology from the South Pole. The 1984/85 campaign. B. Gelly, E. Fossat, G. Grec & M. Pomerantz.	.....	21
Splitting of the low l solar p modes. S. M. Jefferies, C. P. McLeod, H. B. van der Raay, P. L. Pallé & T. Roca Cortés.	.....	25
Helioseismic Observations at Stanford, 1977-1986. H. M. Henning & P. H. Scherrer.	.....	29
Observations of solar global oscillations (1983 - 1985) and potential influence of terrestrial sources of errors. A. B. Severny, V. A. Kotov & T. T. Tsap.	.....	33
Intermediate degree solar oscillations. T. L. Duvall Jr., J. W. Harvey & M. A. Pomerantz.	.....	37
Measurements of solar internal rotation obtained with the Mt. Wilson 60-foot solar tower. E. J. Rhodes Jr., A. Cacciani, M. Woodard, S. Tomczyk, S. Korzennik & R. K. Ulrich.	.....	41

Solar equatorial rotation rate inferred from inversion of frequency splitting of high-degree modes. F. Hill, D. O. Gough, J. Toomre & D. A. Haber.	.....	45
Rotation in the solar convection zone inferred from Fabry-Perot observations of the 5-min oscillations. F. Hill, D. M. Rust & T. Appourchaux.	.....	49
Comparison of solar oscillation data obtained from a study of the Na and K Fraunhofer absorption lines. G. R. Isaak, C. P. McLeod, H. B. van der Raay, P. L. Pallé & T. Roca Cortés.	.....	53
Response of the solar five-minute oscillations to a major flare. D. A. Haber, J. Toomre & F. Hill.	.....	59
Solar 5-min oscillation amplitude anisotropy and Doppler velocity systematics. J. R. Kuhn, C. M. O'Neill & L. B. Gilliam.	.....	63
Ground based observations of solar luminosity oscillations. B. N. Andersen & V. Domingo.	.....	67
Earth based observations of solar luminosity oscillations. A. Jiménez, P. L. Pallé, F. Pérez Hernandez, C. Régulo, T. Roca Cortés, V. Domingo & S. Korzennik.	.....	71
On the 160 minute oscillation. P. L. Pallé & T. Roca Cortés.	.....	75
Search for solar g-modes from 1981 to 1985. P. L. Pallé & T. Roca Cortés.	.....	79
Solar gravity modes from ACRIM/SMM irradiance data. C. Fröhlich.	.....	83
Limb darkening oscillations: the discrepancy with Doppler data and the 160-min period. R. Yerle.	.....	87

2. THEORY OF SOLAR OSCILLATIONS.

Sensitivity of solar p-modes to solar envelope structure. P. Demarque & D. B. Guenther.	.....	91
A solar model with turbulent diffusion mixing: surface abundances and oscillations. Y. Lebreton, G. Berthomieu & J. Provost.	.....	95
The influence of a modified mixing-length theory and of an adopted description of the atmosphere on the solar five-minute oscillations. A. A. Pamyatnykh.	.....	99
Constraints on central solar conditions from helioseismology and neutrino counts. J. Faulkner	.....	105
Do solar models with weakly interacting massive particles reproduce the Stanford seismic data? A. N. Ellis & D. O. Gough	.....	111
The study of oscillations localized near a layer of density discontinuity in an example of solar model. Yu. V. Vandakurov.	.....	115
Inertial modes trapped in the solar convective envelope. W. Dziembowski, A. Kosovichev & M. Kozlowski.	.....	117
Non-newtonian forces and the observed solar oscillation spectrum. J. R. Kuhn.	.....	119
Asymptotic properties of low degree gravity modes. G. Berthomieu & J. Provost.	.....	121
Stellar acoustic ray patterns. J. Perdang.	.....	125
An optimal approach to the inverse problem. W. Jeffrey & R. Rosner.	.....	129
Inverse problem: acoustic potential vs acoustic length. H. Shibahashi.	.....	133
On the technique of the inversion of helioseismological data. M. A. Brodsky & S. V. Vorontsov.	.....	137
An attempt to determine the structure of the solar core from observed g-mode frequencies. A. G. Kosovichev.	.....	141
Inversion of asymptotic gravity-mode frequencies and its application to the Sun. A. N. Ellis.	.....	147

A search of the effects of magnetic field in the solar five-minute oscillations. S. V. Vorontsov.	.....	151
Magnetic perturbations to stellar oscillation eigenfrequencies. D. O. Gough & M. J. Thompson.	.....	155
Magnetic effects on solar p-modes. W. R. Campbell & B. Roberts.	.....	161
The effect of toroidal magnetic fields in the overshoot layer on the eigenfrequencies of stellar oscillations. G. Belvedere.	.....	167
The magnetic field inside the Sun. W. Dziembowski & P. R. Goode.	.....	171
On the implications of the symmetric component of the frequency splitting reported by Duvall, Harvey and Pomerantz D. O. Gough & M. J. Thompson	.....	175
Sunspot seismology. J. H. Thomas, B. W. Lites & T. E. Abdelatif.	.....	181
Oscillations in sunspot umbra, -penumbra and the surrounding photosphere. H. Balthasar, E. Fangmeier, G. Küveler & E. Wiehr.	.....	183
The energy conversions and enhancement caused by the unsteady plasma motion in the active region. Li Zhongyuan.	.....	187
Radial and non-radial oscillations of spherically symmetric stellar systems. Y. Sobouti.	.....	191
<hr/>		
3. LONGTERM VARIATIONS IN THE SUN.		
Time variations of the frequencies of low-degree solar p modes. M. F. Woodard & R. W. Noyes.	.....	197
Solar cycle dependence of solar p modes. G. R. Isaak, S. M. Jefferies, C. P. McLeod, R. New, H. B. van der Raay, P. L. Pallé, C. Régulo & T. Roca Cortés.	.....	201
The solar oscillations spectrum and the solar cycle. A. Jiménez, P. L. Pallé, J. C. Pérez, C. Régulo, T. Roca Cortés, G. R. Isaak, C. P. McLeod & H. B. van der Raay.	.....	205

The 13 day period oscillation and the solar cycle. A. Jiménez, P. L. Pallé, C. Régulo, T. Roca Cortés, G. R. Isaak, C. P. McLeod & H. B. van der Raay.	.....	211
Variations in the mean line of sight velocity of the Sun: 1976-1985. A. Jiménez, P. L. Pallé, C. Régulo, T. Roca Cortés, Y. P. Elsworth, G. R. Isaak, S. M. Jefferies, C. P. McLeod, R. New & H. B. van der Raay.	.....	215
Study of long period global oscillations of Sun through spherical harmonic Fourier analysis of sunspot activity. M. H. Gokhale.	.....	219
Long periods in diameter, irradiance and activity of the Sun. Ph. Delache, F. Laclare & H. Sadsaoud.	.....	223
Solar diameter and solar rotation during the Maunder minimum. E. Ribes, J.-C. Ribes & R. Barthalot.	.....	227

4. ASTEROSEISMOLOGY: RESULTS AND PROSPECTS.

Asteroseismology: results and prospects. W. Däppen, W. A. Dziembowski & R. Sienkiewicz.	.....	233
Evidence for global pressure oscillations in Procyon and α Centauri. B. Gelly, G. Grec & E. Fossat.	.....	249
A photometric search for '5-min' oscillations in the components of Alpha Centauri and two other double stars. L. A. Balona & F. Marang.	.....	253
A spectroscopic search for oscillations in the 769.9 nm potassium line of Procyon. G. R. Isaak & A. R. Jones.	.....	255
The rich p-mode pulsation spectrum of HD 60435. J. M. Matthews, D. W. Kurtz & W. H. Wehlau.	.....	261
Search for oscillations in some Ap stars. J. A. Belmonte, P. L. Pallé & T. Roca Cortés.	.....	265
A search for rapidly oscillating Ap stars in the northern hemisphere. T. J. Kreidl.	.....	269
The radius and the pulsation constant of the primary of Spica. M. Jerzykiewicz & C. Sterken.	.....	273

A survey for Doppler-shift oscillations in K giants. P. H. Smith, R. S. McMillan & W. J. Merline.	.....	277
Modeling the global oscillations of Epsilon Eridani. D. R. Soderblom & W. Däppen.	.....	281
Stellar models of Epsilon Eridani constrained by stellar seismology. D. B. Guenther.	.....	285
Internal constitution and oscillation spectrum of Procyon. P. Demarque & D. B. Guenther.	.....	287
Helium diffusion in rapidly oscillating Ap stars. N. Dolez, D. O. Gough & S. Vauclair.	.....	291
A Hertzsprung-Russell diagram for stellar oscillations. J. Christensen-Dalsgaard.	.....	295
Can stellar mass be measured by asteroseismology? R. K. Ulrich.	.....	299

5. SEISMOLOGICAL INVESTIGATIONS OF COMPACT STARS.

Seismological investigations of compact stars. D. E. Winget.	.....	305
An improved limit for the rate of period change in the ZZ Ceti star G117-B15A S.O. Kepler, D. E. Winget, E. L. Robinson & R. E. Nather.	.....	325
The stellar seismology of the hot white dwarf star PG1159-035. S. D. Kawaler.	.....	329
Pulsations of White Dwarf Stars with Thick Hydrogen or Helium Surface Layers. A. N. Cox, S. G. Starrfield, R. B. Kidman & W. D. Pesnell.	.....	333
The non linear dynamic of the ZZ Ceti variable GD 66. M. Auvergne, A. Baglin & G. Vauclair.	.....	339

6. EXCITATION AND DAMPING OF SOLAR AND STELLAR OSCILLATIONS.

Excitation and damping of solar and stellar oscillations. S. M. Chitre.	.....	345
What do the observations tell us about the excitation of solar oscillation modes? K. G. Libbrecht	.....	359
The role of nuclear reactions in the excitation of stellar oscillations. V. G. Gavryusev & E. A. Gavryuseva.	.....	363
On the excitation of solar five-minute oscillations. H. M. Antia, S. M. Chitre & D. O. Gough.	.....	371
Influence of the perturbation of the Reynolds tensor on the stability of the solar 5 min oscillations. M. Gabriel.	.....	375
Interaction of convection and oscillations in the solar atmosphere: numerical results. M. Steffen	.....	379
Gravity wave generation by large scale bubbles. A. Brandenburg.	.....	383
The evolution to steady nonlinear pulsation in stellar models. G. Kovács & J. R. Buchler.	.....	387
Finally a double-mode RR Lyrae model? J. R. Buchler & G. Kovács.	.....	393
Overstable convection in a non-uniform magnetic field. D. Hermans, M. Goossens, W. Kerner & K. Lerbinger.	.....	395
The critical mass for the overinstability of massive zero-age main sequence stars. J. Klapp, N. Langer & K. J. Fricke.	.....	399

7. OSCILLATIONS IN THE SOLAR ATMOSPHERE.

Diagnosis of the solar atmosphere using solar oscillations. S. Frandsen.	.....	405
Chromospheric seismology. P. Gouttebroze.	.....	421
Infrared Helioseismology: Detection of the chromospheric mode. D. Deming, D. A. Glenar, H. U. Käufel & F. Espenak.	.....	425
Variations of the solar limb brightness with the oscillations. B. Schmieder & P. Mein.	.....	429
Oscillatory properties of meso-scale intensity structures at chromospheric level. L. Damé & M. Martic.	.....	433
On the energy of short period acoustic waves in the solar atmosphere. F.-L. Deubner, M. Reichling & R. Langhanki.	.....	439
Convective overshoot and upper boundary conditions. A. Nesis.	.....	443
Variation of the generalized Compton red shift in the Sun. M. Missana.	.....	447

8. TECHNIQUES FOR OBSERVING SOLAR OSCILLATIONS.

Techniques for observing solar oscillations. T. M. Brown.	.....	453
Continuous magnetic calibration of (velocity) sensitivity of oscillation spectrometers. G. R. Isaak & A. R. Jones.	.....	467
Full-Disk solar Dopplergrams observed with a 1024x1024 Pixel CCD Camera. E. J. Rhodes Jr., A. Cacciani & S. Tomczyk.	.....	471
Performance of a stabilized Fabry-Perot solar analyzer. D. M. Rust, T. Appourchaux & F. Hill.	.....	475
Infrared heterodyne spectroscopy: a tool for helioseismology. D. A. Glenar, H. U. Käufel, D. Deming, T. Kostiuk & M. J. Mumma.	.....	481
A Bayesian approach to ridge fitting in the ω - k diagram of the solar five-minute oscillations. C. A. Morrow & T. M. Brown.	.....	485

Automated p-mode identification using Bayes' theorem. T. M. Brown.	491
---	-------	-----

9. TECHNIQUES FOR OBSERVING STELLAR OSCILLATIONS.

Techniques for observing stellar oscillations. J. W. Harvey.	.....	497
Sodium cell spectrophotometer for detection of stellar oscillations. F. X. Schmider, E. Fossat, G. Grec & B. Gelly.	.....	513
Multiplexed interferometric stellar oscillation spectrometry - MISOS. K. A. R. B. Pietraszewski, C. R. Bell, J. Ring, N. K. Reay & M. Leeper.	.....	517
The precision calcium photometer: a new instrument for astroseismology. P. Nisenson, A. K. Dupree & R. W. Noyes.	.....	521

10. NETWORK AND SPACE OBSERVATIONS OF SOLAR AND STELLAR OSCILLATIONS.

Space observations of solar and stellar oscillations. R. W. Noyes.	.....	527
Experience in operating a limited global network of stations measuring full-disc oscillations of the Sun. Y. P. Elsworth, G. R. Isaak, S. M. Jefferies, C. P. McLeod, R. New, H. B. van der Raay, P. L. Pallé, C. Régulo & T. Roca Cortés.	.....	535
Requirements of a network telescope. I. Elliott.	.....	541
Helioseismology from space, the SOHO project. V. Domingo.	.....	545
Prospect for stellar seismology on board an interplanetary spacecraft. F. Praderie, A. Mangeney, Ph. Lemaire, P. Puget & G.S. Bisnovatyi-Kogan.	.....	549

Observations of stellar oscillations with the Hubble Space Telescope. D. R. Soderblom.	.....	555
<hr/>		
11. SUMMARY OF THE CONFERENCE.		
Overview of the conference: implications of seismological data for astrophysics. A. N. Cox.	.....	561
<hr/>		
12. THE ETCETERA OF ASTRONOMICAL SEISMOLOGY.		
The discovery of late twentieth century mod man. D. Phåknø & E. Rhødz	.....	579
An extremely high 'Q'ueue value applied to seismological meetings. Anonymous (perhaps Hunger & Tooth).	.....	585
<hr/>		
AUTHOR INDEX	.....	587
SUBJECT INDEX	.....	591

