NONLINEAR PHENOMENA IN STELLAR VARIABILITY

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TABLE OF CONTENTS

III. MODELS

IAU COLLOQUIUM No. 134
NONLINEAR PHENOMENA IN STELLAR VARIABILITY

7 – 10 January 1992 held at Joyo Geibun Center, Mito, Japan

Scientific Organizing Committee
A. Baglin, M. Breger, J.-R. Buchler, W. Dziembowski,
Yu. A. Fadeyev, H. Mori, Y. Osaki, J. Percy, H. L. Swinney,
M. Takeuti (chairperson), W. Unno

Local Organizing Committee
H. Ando, T. Hamada (chairperson), K. Saijo, M. Takeuti, Y. Tanaka

The colloquium was held with 77 registered participants from 14 countries. It was scientifically sponsored by IAU Commission 27. The scientific program consisted of an opening talk, 20 invited reviews, 17 oral contributions, 29 posters, and a summary. The colloquium was held just after the disintegration of Soviet Union. Related with problems in the countries of the former Soviet Union, several astronomers did not succeed in participating the meeting. The papers sent by some of them to the Scientific Organizing Committee were presented to the participants as material for discussion. The titles and authors are listed below.

Yu. N. Efremov: The Cs Cepheids - overtone or first crossing?;

Larisa S. Kudashkina and Ivan L. Andronov: The multiperiodicities in the semi-regular variables;

Ivan L. Andronov: Autocorrelation function analysis of the rapid variability of the cataclysmic variables;

V. P. Arkhipova: Photometric evolution and the light oscillations of FG Sge in 1967-1991.

The colloquium was supported by several foundations and companies. We would like to express our thanks to the Commemorative Association for the Japan World Exposition (1970), the Science and Technology Promotion Foundation of Ibaraki, Fujitsu, Ltd., Hitachi Engineering Co. Ltd., Hitachi Tohoku Software Ltd., IBM Japan, Ltd., the Joyo Bank, the Joyo Geibun Center, the Mito Shinkin Bank, Mitsubishi Electric Corporation, NEC Corporation, Rikei Corporation, and the Astronomical Society of Japan for their support. We also express our thanks to Ibaraki University for its kind hospitality

T. Hamada and M. Takeuti

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PREFACE

The nonlinear theory of oscillating systems brings new aspects into the study of variable stars. Beyond the comparison of linear periods and the estimate of stability, the appearance and disappearance of possible modes can be studied in detail. While nonlinearity in stellar pulsations is not a very complicated concept, it generally requires extensive and sometimes sophisticated numerical studies. Therefore, the development of appropriate computational tools is required for applications of nonlinear theory to real phenomena in variable stars.

Taking trends in variable star studies into consideration, the International Astronomical Union organized a colloquium for the nonlinear phenomena of variable stars at Mito, Japan in 1992. The colloquium served to give an overview of the new frontiers of variable star studies and to encourage further development of this field. The colloquium covered the fundamental theory, interesting observational facts, and the numerical modeling.

The publication of the proceedings was somewhat delayed since one of the editors, M. T., was overwhelmed by administrative work. We are sorry that the excellent reviews of Drs. H. Mori, M. Sano, and K. Makishima cannot be found in the proceedings. We also miss the summary given by Dr. W. W. Dziembowski. Throughout the editing procedure Dr. Y. Tanaka of Ibaraki University kindly helped us. Because of the unfortunate delay of the publication, the significance of several papers may be affected. Even so, we believe that the papers are useful to variable star researchers because of their scientific importance.

The editors wish to express their thanks to the editorial board of *Astrophysics and Space Science* and to Kluwer Academic Publishers for their willingness to publish the proceedings.

October 1993 M. Takeuti and J.-R. Buchler

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