

EUROMECH 256

"Nondestructive Three-Dimensional Stress Analysis"  
(A brief report)

EUROMECH 256 was held in Tallinn from September 26 to September 28, at the Institute of Cybernetics.

The Colloquium was divided into five sessions.

The first session was devoted to hybrid experimental-numerical methods. Unfortunately two of the invited speakers, Prof. K. -H. Laermann and Prof. K. A. Jacob canceled their participation some weeks before the Colloquium. However, in the report by A. K. Preiss and A. V. Fomin very original results were reported. The main conclusion of the authors was that it is not necessary to measure displacements over all the surface of the object. Surface conditions at places where measurements cannot be carried out can be determined on the basis of measurements on the remaining part of the surface. After that the boundary value problem of the theory of elasticity can be formulated.

The second session was devoted to holographic and speckle methods. The reports considered measurement techniques for the hybrid method as well as methods for the determination of deformation fields inside transparent models.

During the third session state of the art of the photoelastic scattered light method was considered. An original new method was dealt with by Prof. A. Lagarde. Some general problems of experimental mechanics were considered by Prof. J. T. Pindera (e.g. the problem that near concentrated loads stress distribution in two-dimensional models is always three-dimensional). Many interesting applications were also dealt with.

Reports on various experimental methods were delivered during the fourth session. The most original of them was that by Acad. K. K. Rebane and Dr. J. V. Kikas on the application of spectral hole burning in stress analysis. The method is very ingenious, however, the experiment should be carried out at 1,7° K. Other reports considered application of X-rays, neutron diffraction, acoustic emission and use of inclusions for stress analysis of concerts.

The last session was devoted to integrated photoelasticity. Tomographic approach seems to open up some new possibilities of this method.

Discussions were informal and lively, participation very active. It was the general opinion of the participants that the Colloquium was devoted to a well-chosen topic and succeeded in integrating different approaches to 3-D stress analysis.

The number of participants was 44 (Bulgaria - 1, Canada-1, Denmark - 1, DDR - 1, France - 3, FRG - 2, Greece - 1, Hungary-1, India - 1, Italy - 1, Kuwait - 1, USA - 4, USSR - 26).

Proceedings of the Colloquium will not be published but one or two special issues of the journal "Optics and Lasers in Engineering" will be published including 8 to 12 more interesting papers of the Colloquium. The guest editor will be H. Aben.

Other information can be extracted from the set of documents which are enclosed.

Thanks to generous financial support from the Institute of Cybernetics hotel costs of foreign participants were covered by the Institute. Besides, very foreign participant got daily allowances (11 roubles per day).

Enclosures:

- 1) First Circular
- 2) Preliminary Reply Form
- 3) Second Circular
- 4) Final Registration Form

Materials delivered at the registration:

- 5) EUROMECH 256 at a Glance
- 6) General Information
- 7) Scientific Program
- 8) Abstracts
- 9) List of Participants
- 10) Information about Estonia and Tallinn
- 11) Invitations to social events

The brochure about IFAC's guidelines for presentation of scientific papers was sent only to soviet participants.



H. Aben  
Chairman

October 13, 1989