

EUROMECH

EUROPEAN MECHANICS SOCIETY

Final Report

Please send this report to the Secretary General of EUROMECH, within one month after the Colloquium.

EUROMECH Colloquium No: 444

Title: Critical Review of the Theories of Plates and Shells and New Applications

Dates and location: 22 - 25 September 2002, Bremen, Germany

Chairperson: R. Kienzler (Bremen),

Co-Chairperson: H. Altenbach, (Halle)

Is there need of another Colloquium on the same or a related subject? Which year?

Full registration fee: 200,-€

What other funding was obtained?

DFG (Deutsche Forschungsgemeinschaft), HVG Hanseatische Veranstaltungs-GmbH, University of Bremen, Naberterm GmbH & Co., Airbus Deutschland GmbH.

What were the participants offered? Free lunches, guided tour through the city of Bremen, welcome drink in the Bremer Ratskeller, ship cruise on the river Weser with conference banquet, excursion to Airbus Deutschland, Bremen.

Number of members of EUROMECH (reduced registration fee): 22

Number of non-members of EUROMECH (full registration fee): 28

Number of participants from each country:

Austria	<u>2</u>	Germany	<u>16</u>	Romania	<u> </u>
Belgium	<u> </u>	Great Britain	<u>7</u>	Russia	<u>6</u>
Byelorussia	<u> </u>	Greece	<u> </u>	Slovakia	<u> </u>
Bosnia	<u> </u>	Hungary	<u> </u>	Slovenia	<u> </u>
Bulgaria	<u> </u>	Ireland	<u> </u>	Spain	<u> </u>
Croatia	<u>1</u>	Italy	<u>1</u>	Sweden	<u> </u>
Czech Republic	<u> </u>	Latvia	<u> </u>	Switzerland	<u> </u>
Denmark	<u> </u>	Lithuania	<u> </u>	Ukraine	<u>3</u>
Estonia	<u>1</u>	Netherlands	<u> </u>	Yugoslavia	<u> </u>
Finland	<u> </u>	Norway	<u> </u>	Turkey	<u> </u>
France	<u>3</u>	Poland	<u>7</u>	Others	<u>3</u>
Georgia	<u> </u>	Portugal	<u> </u>	Total	<u>50</u>

Scientific Report

EUROMECH COLLOQUIUM 444

Critical Review of the Theories of Plates and Shells and New Applications

Chairpersons: R. Kienzler (Bremen), H. Altenbach (Halle)

EUROMECH 444 was held at the „Atlantic Hotel Universum“ in Bremen on 22nd – 25th September 2002. There were 50 participants from 15 countries. The presentations were divided into two groups: 26 oral presentations (each of them 30 minutes) and 16 posters (special poster session 4 hours). It was considered that this was the optimum for such a EUROMECH colloquium with a limited number of participants.

The main items and subjects of the presentation and discussions were:

- **formulation approaches and principles of general theories,**
- **formulation of applied theories,**
- **numerical approaches,**
- **asymptotic analysis and**
- **applications**

The conference brought together engineers with civil and mechanical engineering background, mathematicians and others. The participants conclude that there is not “a best theory or formulation approach”, but with respect to application fields you can find better and partly new approximations of the three-dimensional field equations.

All suggested theories were approximative, and the accuracy depends on many factors. In addition, the full reconstruction of the three-dimensional solutions is impossible since any two-dimensional theory is connected with some loss of information.

Applied contributions were related to light-weight structures (sandwiches, composites) and to coupled field problems (thermo-mechanical-electric-magnetic- ...). Due to the fact that there exist a practical need such applications will be discussed also in the future.

Finally, the asymptotic approach was discussed. It was shown that we have to built up more and more bridges to engineering problems.