

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: 402

Title: Micromechanics of Fracture Processes

Dates and location: October 25-27, 1999, Seeheim/GERMANY

Chairperson: Prof. Dr. D. Gross (TU Darmstadt)

Co-Chairperson: Prof. Dr. F.D. Fischer (Montanuniversität Leoben)
 Prof. Dr. E. van der Giessen (TU Delft)

Is there need of another Colloquium on the same or a related subject? Which year? Probably yes, 2003

Full registration fee: 100.- DM

What other funding was obtained? 5800.- DM, German Science Foundation (DFG)

What were the participants offered? Perfectly equipped conference site in a nice environment, free coffee and snacks, abstract volume, conference dinner, etc.

Number of members of EUROMECH (reduced registration fee): 5

Number of non-members of EUROMECH (full registration fee): 25

Number of participants from each country:

Austria	___5	Germany	___34	Romania	___
Belgium	___	Great Britain	___6	Russia	___3
Byelorussia	___	Greece	___	Slovakia	___
Bosnia	___	Hungary	___	Slovenia	___
Bulgaria	___2	Ireland	___	Spain	___
Croatia	___	Italy	___1	Sweden	___1
Czech Republic	___	Latvia	___1	Switzerland	___2
Denmark	___	Lithuania	___	Ukraine	___1
Estonia	___	Netherlands	___3	Yugoslavia	___
Finland	___	Norway	___	Turkey	___
France	___5	Poland	___2	Others	___5
Georgia	___	Portugal	___	Total	___71_

Scientific Report

The colloquium took place on October 25th-27th, 1999 at the Lufthansa Training Center in Seeheim near Darmstadt. Its aim was to provide a forum for engineers and scientists, working in the broad field of micromechanics of fracture and damage processes. The micromechanical approach is of increasing significance because it offers a deeper insight in the nature of material failure, allows to realistically model complex material behavior and provides a basis for the improvement of material properties relevant to failure.

The colloquium has been attended by 71 scientists from 17 countries. Among them were 5 participants from 3 noneuropean countries. In 30 lectures and 13 poster presentations, the attendees reported about their recent or current research from the theoretical, numerical and experimental point of view. Many well known experts contributed to the program as well as plenty of young participants. The presentations showed the significant progress in understanding failure processes on the microlevel and in its description by realistic models on different scales. Main topics have been among others the heterogeneous material structure, gradient effects, micromorphological influences on the behavior of crystals or 2-phase materials, modeling of microdefect evolution in brittle and in ductile materials, continuum damage modeling, micro-macro interaction, discrete versus continuous models, general mathematical aspects of multiple failure in solids and last but not least the numerical realization of micro failure models. It would have been interesting to have more contributions from both of the last mentioned fields which are of considerable importance for modeling discrete multi-failure of large systems. In summary, the colloquium showed as a clear trend that micromechanics becomes more and more important in understanding and in the description of fracture processes. This refers also to the application of fracture mechanics to practical problems although the material data basis on the microlevel is often incomplete. Beside this problem, it is a fact that consideration of micromechanical aspects goes hand in hand with the development of computer power and numerical methods.

The conference program and the contents of the presentations is summarized in the enclosed abstract volume of approximately 100 pages.

The informal atmosphere, supported by the location and facilities of the conference site, has led to interesting discussions and fruitful contacts between the participants. Post-colloquium reactions of attendees were positive and suggest to repeat a meeting on this topic after a few years.

Darmstadt, 2000-02-16



Dietmar Gross

Please use additional pages if needed. Put date and signature at the end.