EUROMECH   Final Report

EUROPEAN MECHANICS SOCIETY

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

EUROMECH Colloquium No: **451**

Title: **Sea Wave Bottom Boundary Layer**

Dates and location: **26-29 October 2003 – Taormina (ME), Italy**

Chairperson: **Enrico Foti, University of Catania, Italy**

Co-Chairperson: **Jorgen Fredsøe, Denmark Technical University, Denmark**

Is there need of another Colloquium on the same or a related subject? **Yes** Which year? **2006**

Full registration fee: **€ 290 (+32€ for non Euromech member)**

What other funding was obtained? **from Faculty of Engineering of University of Catania, from Messina Society of Engineers and from Catania Society of Engineers.**

What were the participants offered? **Book of Abstracts, conference material (conference bag, notebook, pen, badge), 1 ice-breaking stand-up dinner, 2 lunches, 5 coffee-breaks and 1 gala dinner, help with hotel booking. Conference room.**
Please note that the cost of the three general lectures (air tickets, hotel accommodation and transportation) were completely covered within the conference budget.

Number of members of EUROMECH (reduced registration fee): **10**

Number of non-members of EUROMECH (full registration fee): **29**

Number of participants from each country:

Country		Country		Country	
Austria	____	Germany	____	Romania	____
Belgium	____	Great Britain	_9_	Russia	____
Byelorussia	____	Greece	____	Slovakia	____
Bosnia	____	Hungary	____	Slovenia	____
Bulgaria	____	Ireland	_1_	Spain	____
Croatia	____	Italy	_17_	Sweden	_1_
Czech Republic	____	Latvia	____	Switzerland	____
Denmark	_3_	Lithuania	____	Ukraine	____
Estonia	____	Netherlands	_2_	Yugoslavia	____
Finland	____	Norway	_2_	Turkey	____
France	_5_	Poland	____	Others	USA 2
Georgia		Portugal		Total	_42_

Scientific Report

EUROMECH Colloquium no. 451 "Sea Wave Bottom Boundary Layer"

The colloquium was held in Taormina (Italy) from the 26th of 29th of October 2003. The aim of the meeting was to provide opportunities for scientists to meet each other and to discuss their current research on sea wave bottom boundary layers.
The topic of the Colloquium was faced from three different viewpoints: field investigations, experimental investigations and theoretical and numerical modelling.
Three invited lecturers introduced the three day meeting giving talks on the following topics:
"Field investigation of wave boundary layer" given by Prof. John TROWBRIDGE, from Woods Hole Institute of Oceanography (USA) on the first day;
"Experimental investigation of wave boundary layer" given by Prof. B. Mutlu SUMER, from Technical University of Denmark (Denmark) on the second day;
"Theoretical and numerical investigation of the sea wave boundary layer" given by Prof. Giovanna VITTORI from University of Genoa (Italy) on the last day.

The time allowed for each presentation was 20 minutes followed by 5-10 minutes of discussion, during which several hints were given by the audience. As a matter of fact in order to enhance the possibility of discussion, the question time has never been interrupted, even if out of schedule. It is worth pointing out that the presence of a large number of young scientists stimulated quite a lot the discussion.

A scholarship of 200€, provided by the EUROMECH was given as a financial support for the participation in the Colloquium to the following three young scientists, selected by the two chairpersons:
- **Dave O. Lambkin**
    School of Ocean & Earth Science - Southampton Oceanography Centre
    European Way, Southampton, SO14 3ZH U.K.
    D.O.Lambkin@soc.soton.ac.uk
- **Tristan O. Robinson**
    Dept. of Civil & Environmental Engineering - University College London
    Gower Street, WC1E 6BT London, U.K.
    tristan.robinson@ucl.ac.uk
- **Jebbe van der Werf**
    Dept. of Civil Engineering - University of Twente
    P.O. Box 217, 7500 AE Enschede, The Netherlands
    J.J.vanderWerf@ctw.utwente.nl

Specific contributions and discussions covered quite extensively the interaction of the flow with the sea bottom, also in presence of both small and large scale beforms.
Great attention has been devoted to the study of wall turbulence. From the experimental point of view, particularly by using flow visualization methods, quantitative measurements of the velocity profiles have been presented. Many presentations were also given on the mechanism of ripple formations and on turbulence induced by rippled bed. Very detailed investigations by means of DNS techniques have been carried; such investigations showed good performances particularly in representing the turbulence within the boundary layer. Also the topic of wave-current interaction has been faced by several scientists.

At the end of the Colloquium a final "wrap-up" discussion, which involved all the scientists, has been developed. It has been observed that, despite the importance of experimental campaign, both in the field and in the laboratory, among 31 contributions only 1 presented results coming from a field investigation, and only 8 concerned experimental works. Thus the community should promote with more strength field

investigations notwithstanding all the economic and logistic problems related to such a job. Indeed, field data are still insufficient, particularly in presence of sandy bedforms.

Moreover, it was recognized that a very detailed flow modeling has been attained, whereas, at present, only a very little understanding of the processes of sediment-flow and grain-grain interactions is available.

Few open questions related to experimental investigations remain still open. Indeed there is a lack of laboratory data for the fully turbulent regime, which is a condition closer to the field, particularly for the wave plus current case.

Finally, even though the numerical modeling has achieved a very detailed description of the flow, still a lot of work needs to be done on the knowledge of the flow-sediment interaction.

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