

EUROMECH

Final Report

Date: march 1st 94

Please send this report to the Secretary of the European Mechanics Council, Professor Bengt Lundberg, Dept of Mechanical Engineering, Luleå University of Technology, S-951 87 Luleå, Sweden, within one month after the Colloquium.

General

Euromech Colloquium No: 310

Title: SEDIMENT TRANSPORT MECHANISM IN COASTAL ENVIRONMENTS AND RIVERS

Co-Chairmen: Pr BELORGEY

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Place and country: LABORATOIRE DE MECANIQUE DES FLUIDES
UNIVERSITE DU HAVRE (FRANCE)

Dates: 13 to 17th september 1993

Finance

The conference fee 2000 FF included

With the help of the:

- Conseil Régional	60000FF
- Conseil Départemental	5000FF
- Ville du Havre	8000FF
-A.U.M.	4000FF

Funding: YES

Accommodation (type and cost): NO

Meals: YES

Participation

Total number of participants: 68

Distribution of participants by country:

Code	Country	Number	Code	Country	Number
A	Austria	_____	IRL	Ireland	_____
B	Belgium	_____	LT	Larvia	_____
BG	Bulgaria	_____	LV	Lithuania	_____
CH	Switzerland	<u>1</u>	N	Norway	<u>2</u>
CS	Czechoslovakia	_____	NL	Netherlands	<u>2</u>
D	Germany	<u>3</u>	P	Portugal	<u>3</u>
DK	Denmark	<u>6</u>	PL	Poland	_____
E	Spain	_____	R	Rumania	_____
EE	Estonia	_____	S	Sweden	_____
F	France	<u>20</u>	SF	Finland	_____
GB	Great Britain	<u>17</u>	YU	Yugoslavia	_____
GR	Greece	_____	CIS	CIS	_____
H	Hungary	_____	-	Others	_____
I	Italy	<u>7</u>		Canada	<u>1</u>
				U.S.A.	<u>2</u>
					Australia <u>1</u>
					Japan <u>1</u>
					South Africa <u>2</u>

Is there need of another colloquium on the same subject? Which year? YES IN PORTUGAL (1996)

EUROMECH 310

SEDIMENT TRANSPORT MECHANISM IN COASTAL ENVIRONMENTS AND RIVERS

LE HAVRE - FRANCE
September 13 - 17, 1993

SCIENTIFIC REPORT

The present EUROMECH is a continuation of a little series of congress (every 2 to 3 years since 12 years), which each corresponds to a specific scientific stage.

The reasons of its organization in Le Havre are various :

* The first reason concerns the French scientific community of this field. This is now very few and scattered. In the last international meetings of this type (Genoa EUROMECH 265, 1988 or Wallingford EUROMECH 262, 1990), French researchers were very few represented. Such a scientific event was a means of rallying them and to raise a new dynamism in this community.

* The second reason concerns the geographic position of Le Havre. The area of Le Havre is a full scale laboratory concerning the transport of sediments, with :

- an estuary which is particular because it is located in sea with large tidal,
- a coast which is under the influence of sea attacks. The average of sea erosion on Norman cliffs is half a meter per year.

* The third reason is at the origin of the specificity of the scientific program of this EUROMECH relating to sedimentary transport. In fact, the actual development of the instrumentation allows different and new approaches of this problem. That is the reason why we have wished to include a special session concerning the new experimental techniques. These new techniques allow also (or sometimes) to analyse the phenomena directly in situ. This is also the reason why we have wished to rally in a same session the paper concerning the research in situ (coastal environments and rivers).

On another hand, the phenomena of the sediment transport is generally associated to applied research. But in our point of view it is impossible to dissociate the applied research and the fundamental research.

For this reason, we have not separated in a same topic the different approaches (theoretical, numerical or experimental) in the study of a phenomenon.

The scientific program of the congress was divided in 8 sessions.

The first session entitled : "*Transition from the laminar to the turbulent regime, and turbulence structure over a flat bed or rippled bed*" was sanctioned to the analysis of the structure of the flow in the vicinity of a fixed bottom and to the influence of the morphology of the ripples or dunes on the sedimentary transport and the stability of the bottom.

The second session entitled : "*Oscillatory flow over a rippled bed*" resumed same studies but in the case of a particles light bottom.

During a long time, the question was to know if the boundary layer was laminar or turbulent. Now with the actual knowledge we have a new interpretation. Some works show that the characteristics of the flow in the boundary layer generated by the swell (in laboratory) corresponds to the flow which

transit from a laminar flow to a chaotic flow. And the swell which is periodic excites this specific flow and allows a fundamental study of the transition to the chaos and the development of the instability. This approach allows to understand more the hydraulic mechanism and the characteristic transport coefficient and diffusion coefficient in this boundary layer.

The third session entitled : "*Experimental approaches in situ*" included two parts, one related to the coastal field where the new exploration techniques (multiparametrical stations) allowed important progress in the knowledge of phenomena. Another related to the study of the transport in estuary. New models concerning mud transport have been pointed out.

The fourth session : "*Sediment transport over ripples both as bed and as suspended load*" was sanctioned to the suspended transport and to the comparison between the new models and the experimental results.

The fifth session : "*Coastal sediment transport on beach (offshore region, surf region, swash zone)*" was more sanctioned to the analysis of the flow and sedimentary transport in the breaking waves area on front or oblique attack. The study of these transport regions is recent and the results pointed out are original and lead to ask many questions from the participants.

The sixth session : "*New techniques for measuring concentration (in the laboratory and in situ)*" was very important and there were many papers. New techniques of measurement : of particles diameter, of concentration or tension of friction have been presented. The comparison between physicians specialists in instrumentation and hydraulic engineers has been very fructuous.

The seventh session : "*Sediment transport by swell and transversal or longitudinal current*" complete the sessions 1, 2 and 4 taking into account the complex flow constituted of the swell and currents. The approaches so complexed are relatively recent and the presented results very original.

The eighth session : "*Sediment transport in rivers and estuaries*" was principally sanctioned to the sedimentary transport in rivers and particularly in estuaries. The studies was related to the associated modelisation of hydraulic jump and the friction constraint and also to the deformation and the stability of the bottom and the loops.

Each session gave rise to many questions (and comparisons). The works of the congress will be published in the form of articles more important than the extended abstracts by the "World Scientific Publishing Co Ltd" editions.

By another way, the development of the works being important, another congress will be organized on these topics in three years in Portugal.

March 2nd, 1994


M. BELORGEY