



# Two-phase modelling for Sediment dynamics

## THESIS-2013

June 10-12, 2013, Chatou - France  
EDF R&D (Amphitheatre H)

*Provisional Program - 24042013*

### Monday June 10<sup>th</sup>, 2013

08:30-09:30 Registration – Welcome coffee  
09:30-10:00 Opening Ceremony

**10:00-10h40:** **Keynote Lecture**  
Two-Phase model for saltation  
by *E. Meiburg, UC Santa Barbara, USA.*

#### **Session A-1 : Fundamentals (physical processes, mathematical formulations and parameterisation)**

Chairman : **J. Jenkins**

10:40-11:00 Effects of asymmetric strained stratification on currents turbulence and sediment transport in a complex Region of Freshwater Influence (ROFI)  
by *A.J. Souza and A. Lane,*

11:00-11:20 An approximate analysis of a nearly saturated, inclined, particle-fluid flow  
by *M. Larcher, University. of Trento and J.T. Jenkins, Cornell University*

11:20-11:50 **Coffee-Break**

#### **Session B-1 : Two-phase Flow modelling (numerical techniques, turbulence modelling)**

Chairman: **T.J. Hsu**

11:50-12:10 An Eulerian/Euler-Lagrangian numerical investigation of sediment transport  
by *Z. Cheng, S. D'Albignac, T.J Hsu, X. Yu, I.M. Sou, J. Calantoni*

12:10-12:30 A 3D numerical investigation of fine sediment transport in an oscillatory channel and its implications to the state of muddy seabed  
by *T.J. Hsu, C.E. Ozdemir, X. Yu, S. Balachandar*

12:30-12:50 Extension of  $k-\omega$  turbulence closure to two-phase sediment transport modelling: application to sheet flows  
by *L.O. Amoudry, National Oceanography Centre*

12:50-14:15 **LUNCH**

14:15-14:55 **Keynote Lecture**  
The erosion of granular beds under the action of fluid shearing flows  
by *E. Guazzeli, Aix-Marseille Univ., CNRS, IUSTI*

**Session A-2 : Fundamentals (physical processes, mathematical formulations and parameterisation)**

Chairman : **D. Muir Wood**

- 14:55-15:15 Numerical simulation of sediment processes and resulting bedforms: application to scouring at an obstacle  
*by M. Burkow and M. Griebel, University of Bonn*
- 15:15-15:35 Collisional sheet flows  
*by D. Berzi, Politecnico di Milano*

**15:35-16:00 Poster Session**

- Modelling of Breach in Cohesive Embankments due to Overtopping *by Zhao et al.*
- Estimation of suspended sediment in the watershed of the Wadi Bellah, Algeria (1974-2007), *by Elahcene et al.*
- Comparison of sediment transport models *by Guillermo Cardoso-Landa*
- Numerical simulation of flow and large-scale bed variation using quasi-3D flow analysis methods, *by Kosuke Tabata et al.*
- Uncertainties in the evaluation of sediment transport in rivers, *by Medhi Yasi and Alireza Yasi*

**16:00-16:30 Coffee-Break**

**Session C-1 : Experimental techniques in laboratories and in the field**

Chairman: **M. Brocchini**

- 16:30-16:50 Erosion dynamics of a granular bed in a quasi-bidimensional sluice-gate set-up  
*by M. Rabaud, P. Gondret, R. Martino, M. Piva and A. Paterson,*
- 16:50-17:10 Improvement of acoustical characterization of suspended particles in wastewater  
*by P. Schmitt, A. Pallares and M.N. Pons, ICUBE Mechanic Dept.*
- 17:10-17:30 Experiment analysis of the stability of cobbles and boulders in high-gradient rivers  
*by D. Duma, S. Erpicum, P. Archambeau, M. Pirotton and B. Dewals*
- 17:30-17:50 Local measurements of erodibility of artificial cohesive sediments in an annular flume  
*by K.S. Pouv, A. Besq and S. Guillou*

**18:00-19:30 Reception Cocktail offered by the Local Organising Committee**

**Tuesday June 11<sup>th</sup>, 2013**

**9:30-10:10 Keynote Lecture**

*by S. Elghobashi – UC, Irvine, USA*

**Session B-2 : Two-phase Flow modelling (numerical techniques, turbulence modelling)**

Chairman: **E. Meiburg**

- 10:10-10:30 Hybrid two-phase / mixture modeling of sediment transport  
*by E.A. Toorman and Quilong Bi, KU Leuven, Belgium*

- 10:30-10:50 A two-phase model based on frictional rheology for sheet flow regime  
by *T. Revil-Baudard and J. Chauchat*,
- 10:50-11:10 Study of polydisperse particulate systems with a ‘Direct-forcing/Fictitious Domain’ method  
by *R. Verjus and S. Guillou*,
- 11:10-11:40 Coffee-Break**

**Session D-1 : Environmental applications (sheet flows, highly concentrated flows...)**  
Chairman: **A. Soldati**

- 11:40-12:00 Numerical calculation for bed variation in compound-meandering channel using depth integrated model without assumption of shallow water flow  
by *T. Uchida and S. Fukuoka*,
- 12:00-12:20 An application of 3D turbulent model for water flows and sediment transport  
by *L. Cheng and D. Jiaquan and C. Rong Li, Ministry of Water resources, China*
- 12:20-12:40 Numerical investigation of angular submerged jet and tailwater depth variations on dimensions of scour hole  
by *R.K. Kojoori, M.R. Pirestani and A.A. Dehghani*
- 12:40-13:00 Investigation of key problems in tidal current sediment numerical model in Pearl River estuary  
by *H. Yong, W. Xianfang, D. Jiaquan and X. Fengjun*,
- 13:00-14:20 LUNCH**

**Session A-3 : Fundamentals (physical processes, mathematical formulations and parameterisation)**

Chairman : **P. Gondret**

- 14:20-14:40 Two-phase modelling of wave-induced sheet-flow: Erosion depths and sediment fluxes and their dependency on grain size and streaming  
by *W.M. Kranenburg, T.J. Hsu and I.S. Ribberink*,
- 14:40-15:00 The influence of boundary conditions on the deposition from particles-laden turbulent jets  
by *S. Chiban, A. Terfous, A. Ghenaim and J.B. Poulet, Fr*
- 15:00-15:20 Polydisperse sedimentation: a multilayer approach discretized by PVM finite volume methods  
by *E.D. Fernandez-Nieto, E.H. Kone, T. Morales de Luna and R. Bürger*
- 15:20-15:40 Lattice Boltzmann simulation of particle-fluid interaction in grid-generated turbulence  
by *J.F. Zhang, Q.H. Zhang, G.Q. Qiao and J.L. Xiao, Chian*
- 15:40-16:10 Coffee-Break**

## Session C-2 : Experimental techniques in laboratories and in the field

Chairman: S. Elghobashi

- 16:10-16:30 Fluid-particle interaction and generation of coherent structures over permeable beds: an experimental analysis  
*by M. Postacchini, S. Corvaro, M. Miozzi, A. Mancinelli and M. Brocchini,*
- 16:30-16:50 Experimental and numerical investigation of meandering jets in shallow reservoir: potential impacts on deposit pattern  
*by Y. Peltier, S. Erpicum, P. Archambeau, M. Pirotton and B. Dewals, Université Catholique de Louvain, Belgium*
- 16:50-17:10 Size-segregation in bedload transport: experiments and binary continuous modelling  
*by C. Bel, K. Rorsman and P. Frey, IRSTEA*
- 17:10-17:30 Erosion of a water immersed granular bed by a normal water jet  
*by S. Badr, G. Gauthier and P. Gondret, Lab. FAST, Univ. Paris-Sud*

### Wednesday June 12<sup>th</sup>, 2013

9:30-10:10

#### Keynote Lecture

*by S. Fukuoka – Chuo University, Japan*

## Session B-3 : Two-phase Flow modelling (numerical techniques, turbulence modelling)

Chairman: E.D. Fernandez-Nieto

- 10:10-10:30 Modeling excess pore pressure dissipation during sedimentation-consolidation of mud using a two-phase approach  
*by J. Chauchat and S. Guillou, Fr*
- 10:30-10:50 Discrete element modelling of bed load transport  
*by R. Maurin, B. Chareyre, J. Chauchat and P. Frey, IRSTEA, Fr*
- 10:50-11:10 Two-phase study of Erosion by a vertical jet  
*by D. Pham Van Bang, K.D. Nguyen and M. Uh Zapata, Fr*
- 11:10-11:40 **Coffee-Break**

## Session D-2 : Environmental applications (sheet flows, highly concentrated flows...)

Chairman: E. Guazzeli

- 11:40-12:00 Erosion predetermination in small watersheds and estimation of the life expectancy of hill lakes in the semi arid regions in Tunisia  
*by M. Boufaroua, M. Slimani, J.M. Lamachere and T. Oweis, Fr*
- 12:00-12:20 Turbulent sediment transport – a numerical study

- 12:20-12:40 *by O. Duran, B. Andreotti and P. Claudin, PMMH ESPCI CNRS, Fr*  
Two-dimensional riverbed variation analysis method focused on bed surface unevenness and the mechanism of sediment transport in stony-bed rivers  
*by K. Osada and S. Fukuoka, Chuo University - Japan*
- 12:40-13:00  
Suspended sediment and metals fluxes for a small watershed  
*by C. Poletto, Federal University of Technology - Brazil*
- 13:00-14:15 LUNCH**

**Session A-4 : Fundamentals (physical processes, mathematical formulations and parameterisation)**

**Chairman: S. Fukuoka**

- 14:15-14:35 Resuspension of particles under successively breaking solitary waves  
*by Y.S. Park, Dundee University, UK*
- 14:35-14:55 Phase-resolved simulations of bed-load transport  
*by B. Vowinckel, T. Kempe and J. Fröhlich, Germany*
- 14:55-15:15 Onset of flow and erosion in granular sediments  
*by D. Muir Wood and P. Dong, University of Dundee, UK*
- 15:15-15:35 Dispersion and seimentation of particles in stratified flow  
*by S. Lovecchio, F. Zonta and A. Soldati, University of Udine-Italy*
- 15:35-16:45 Round-Table & Closing Ceremony**  
Session chairman: **Ping Dong - University of Dundee**

**Local Organising Committee**

**K.D. Nguyen (Lab. St. Venant) - Chair of the Conference and**

M. Benoit (EDF R&D - Lab. St Venant)

S. Guillou (University of Caen)

N. Sheibani (SHF - Conference secretary) at [n.sheibani@shf-hydro.org](mailto:n.sheibani@shf-hydro.org)

J.G. Philipps (SHF)

D. Pham Van Bang (Lab. St Venant)

