1st Announcement of the International Workshop / School on

Tracer and Timescale Methods for Understanding Complex Geophysical and Environmental Processes

Louvain-la-Neuve, Belgium

August 16-19, 2011

www.uclouvain.be/ttm2011/

Motivation. Understanding advective-diffusive transport and production/destruction processes of dissolved constituents in natural fluid flows is an important challenge in Earth and environmental sciences with many diverse applications. Moreover, geophysical and environmental models routinely produce huge amounts of real numbers. To make sense of them, computer graphics is not sufficient, and has to be complemented with specific interpretation methods. Among them, an approach that is progressively becoming popular consists in using real or hypothetical tracers to tag fluid masses and estimating associated timescales, i.e. age, residence time, transit time, etc. Such timescales lead to very helpful diagnoses that are increasingly applied in interdisciplinary environmental studies. The workshop/school will review what has been achieved so far in this field of research and suggest new developments.

Scientific programme. Tutorials will be delivered by members of the scientific committee. In addition, oral contributions or posters are expected to be presented by most of the attendees, dealing with model studies, theoretical developments, field measurements — for model validation or other purposes — or numerical methods, be they of a Eulerian or Lagrangian nature. The diagnoses may concern air, water, passive/inert tracers, biogeochemical variables, sediment particles, etc.

Practical information about deadlines, abstract submission, accommodation and workshop venue will progressively be posted on the abovementioned web site and will be distributed to the workshop/school mailing list.

Tutorials and selected articles originating from this workshop/school will be published in a book edited by the relevant members of the scientific committee.

Scientific committee: M. Bocquet (ParisTech, Marne la Vallée, France) • F. Cornaton (Tecnologico de Monterrey, Mexico) • A. de Brauwere (VUB, Brussels, Belgium) • E. Deleersnijder (Louvain-la-Neuve, Belgium) • E.J.M. Delhez (Liège, Belgium) • J.-C. Dutay (LSCE, Saclay, France) • M. Elskens (VUB, Brussels, Belgium) • M.H. England (UNSW, Sydney, Australia) • T.W.N. Haine (Johns Hopkins Univ., USA) • E. Hanert (Louvain-la-Neuve, Belgium) • A.W. Heemink (Delft, The Netherlands) • M. Holzer (UNSW, Sydney, Australia) • W.J. Jenkins (WHOI, USA) • S. Khatiwala (Lamont-Doherty Earth Observatory of Columbia Univ., USA) • F. Primeau (Univ. California Irvine, USA) • D. Roche (LSCE, Saclay, France) • M. Vanclooster (Louvain-la-Neuve, Belgium) • J. Vanderborght (KULeuven, Belgium & Forschungszentrum Jülich GmbH, Germany) • D.W. Waugh (Johns Hopkins Univ., USA) • Others* •

Organising committee: Anouk de Brauwere • Eric Deleersnijder • Eric J.M. Delhez • Marc Elskens • Thomas W.N. Haine • Emmanuel Hanert • Marnik Vanclooster • Jan Vanderborght •

Sponsors: BELSPO (www.belspo.be/iap) • ENVITAM (www.envitam.org) • F.R.S.-FNRS* (www.fnrs.be) • FWO* (www.fwo.be) • NASA* (www.nasa.gov) • Others* •

Informal inquiries or requests for inclusion in the mailing list should be directed to Eric Deleersnijder (eric.deleersnijder@uclouvain.be, www.ericd.be).

* to be confirmed

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Tutorials to be presented at the International Workshop / School on

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Marc Bocquet (ParisTech, Marne la Vallée, France): Inverse modelling and data assimilation for atmospheric tracers

Fabien Cornaton (Tecnologico de Monterrey, Mexico) Finite element/volume methods for computing timescales for diagnosing groundwater flows

Anouk de Brauwere (VUB, Brussels, Belgium): The constituent-oriented age and residence time theory (CART): water renewal of and connectivity in semi-enclosed domains

Eric Deleersnijder (Louvain-la-Neuve, Belgium): The constituent-oriented age and residence time theory (CART): age and applications

Eric J.M. Delhez (Liège, Belgium): The constituent-oriented age and residence time theory (CART): residence/exposure time and applications

Marc Elskens (VUB, Brussels, Belgium): Theory and applications of tracers in isotope flux experiments: design, uncertainty analysis, model selection and inference

Matthew H. England (UNSW, Sydney, Australia): The age of water and ventilation timescales in the global ocean

Thomas W.N. Haine (Johns Hopkins Univ., USA): Transit-Time Distributions: a tool to diagnose rates and pathways of tracer transport in advective/diffusive flows

Emmanuel Hanert (Louvain-la-Neuve, Belgium): Mathematical and numerical modelling of non-Brownian diffusion

Arnold W. Heemink (Delft, The Netherlands): Modelling transport processes using stochastic differential equations

Mark Holzer (UNSW, Sydney, Australia): Path-density distributions for surface-to-surface transport with oceanic and atmospheric examples

William J. Jenkins (Woods Hole Oceanographic Institution, USA): The use of coupled tracers to study ocean ventilation processes

Samar Khatiwala (Lamont-Doherty Earth Observatory of Columbia Univ., USA): Green function / Transit Time Distribution methods for estimating anthropogenic carbon in the ocean

François Primeau (Univ. California Irvine, USA): Maximum entropy method for deconvolving fluid transport timescales from tracer observations

Didier Roche (LSCE, Saclay, France): (Bio)geochemical tracers to evaluate the ocean circulation: paleoceanographic applications

Marnik Vanclooster (Louvain-la-Neuve, Belgium): Tracing and modelling agro-chemicals from the soil surface to the groundwater body at different spatial scales

Jan Vanderborght (KULeuven, Belgium & Forschungszentrum Jülich GmbH, Germany): Vadoze zone tracing and modelling

Darryn W. Waugh (Johns Hopkins Univ., USA): Timescales for understanding stratospheric transport