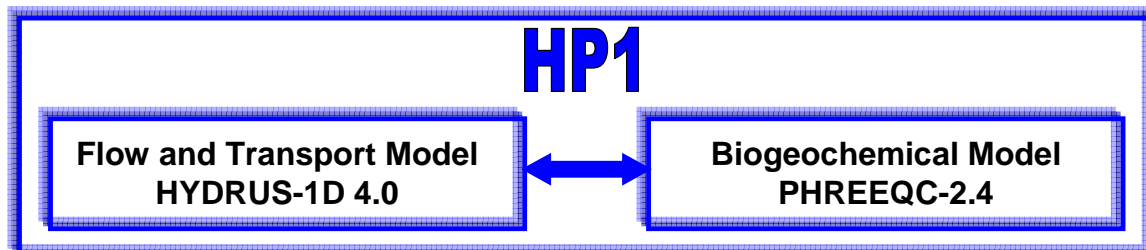




Simulating Soil Water Movement and Solute Transport

using

the Biogeochemical Transport Model **HP1**
(HYDRUS + PHREEQC)



The short course is organized at CIRAD of Montpellier, France

September 22 - 26, 2008

Presenters: **Jirka Simunek** – University of California Riverside (California - USA)
Diederik Jacques - SCK.CEN (Flanders – Belgium)

The course, presented in English, is open to 20 scientists or PhD students.

Basic knowledge of the theory of water movement, solute transport, and geochemistry is recommended.

Contact: Julie Sansoulet julie.sansoulet@cirad.fr

Program

Monday - Tuesday, September 22 - 23 (HYDRUS)

Monday 9h-12h30 – Jirka Simunek

Theory behind HYDRUS

Soil water movement: Richards equation, soil hydraulic parameters (van Genuchten, Mualem, Brooks and Corey,), initial and boundary conditions.
Parameter estimation of soil hydraulic parameters.

Monday 13h30-16h30 – Jirka Simunek

Practical exercises with HYDRUS

Direct and inverse applications of the water flow module of HYDRUS-1D

Tuesday 9h-12h30 – Jirka Simunek

Theory behind HYDRUS

Solute transport: convection-dispersion equation, dispersivity, adsorption, degradation (Langmuir/Freundlich, decay chains, volatilization, mobile/immobile water fractions, ...)
Parameter estimation of solute transport and reaction parameters

Tuesday 13h30-16h30 – Jirka Simunek

Practical exercises with HYDRUS

Direct and inverse applications of the solute transport module of HYDRUS-1D
Demonstration of HYDRUS (2D/3D)

Wednesday - Friday, September 24 - 26 (HP1)

Wednesday 9h-12h30 – Diederik Jacques

Theory concepts and practical exercises with PHREEQC

Principles of geochemical modeling: Introduction to PHREEQC
Defining initial solutions in PHREEQC

Wednesday 13h30-16h30 – Diederik Jacques

Theory concepts and practical exercises with PHREEQC

Reactions (mix): equilibrium_phases, gas_phase, solid_solutions

Thursday 9h-12h30 – Diederik Jacques

Theory concepts and practical exercises with PHREEQC

Principles of reactive transport modeling with PHREEQC

Thursday 13h30-16h30 – Diederik Jacques

Theory concepts and practical exercises with PHREEQC

Principles of reactive transport modeling with PHREEQC

Friday 9h-12h30 – Diederik Jacques

Theory concepts and practical exercises with HP1

Principles of reactive transport modeling with HP1
Exchange reactions / surface complexation reactions

Friday 13h30-16h30 – Diederik Jacques

Theory concepts and practical exercises with HP1

Principles of reactive transport modeling with HP1
Kinetics: sequential/parallel reactions, biodegradation (Monod), mineral dissolution/precipitation

Registration and Lodging

- **Registration:**
800 Euro for academic personnel (Research Institutes or Universities)
1000 Euro for personnel from private companies

- **Hotel Suggestion next to CIRAD (5 min by foot) :**

Héliotel (**)

Rd-Pt Agropolis,

rte de Mende

34980 MONFERRIER SUR LEZ

04 67 41 54 00

04 67 41 54 54

<http://www.heliotel.com/>

Night only: 48.60 euros

Breakfast only: 6.5 euros

Dinner only: 25 - 35 euros

Package: Night + Breakfast + Dinner (negotiated by CIRAD) = 67 euros

- **Lunch Suggestion:**

CIRAD restaurant: 8.75 euros

We can provide a list of other hotels.