

New [telemac3d features for v5p6](#) links from [New version features](#)

v5p6 TELEMAC-2D

Date: 5th Juillet 2006

The principal features of this version v5p6 of TELEMAC-3D are:

- Monotonicity of diffusion
- A new preconditioning for diffusion
- Mass-conservation with SUPG
- Edge-based storage
- Treatment of fluxes at the boundaries
- Logarithmic profiles at boundary conditions

New options and new or modified keywords
All PRECONDITIONINGS

A new preconditioning has been introduced: 17. It consists of solving 1-dimensional linear systems on every vertical. If there is no horizontal diffusion, it will give for diffusion equations an exact solution in 1 iteration.

MATRIX STORAGE

Edge-based storage is now possible with **MATRIX STORAGE : 3** and **STOCKAGE DES MATRICES : 3**

Was previously restricted to the 2D part, now extended to prisms with a speed-up up to 1.6.

Default is 1, for EBE storage

IMPLICITATION FOR DIFFUSION (IMPLICITATION POUR LA DIFFUSION)

Implicitation for diffusion and Wave equation

In wave equation, it was taken into account only for the diagonal of the diffusion matrix, now it concerns also extra-diagonal terms linking points on a vertical.

TREATMENT OF FLUXES AT THE BOUNDARIES (TRAITEMENT DES FLUX AUX FRONTIERES)

1 : as before, priority to prescribed value

2 : priority to prescribed flux

There is one value per liquid boundary. Option 2 takes into account the fact that setting a prescribed value on a boundary triggers an artificial flux that may be unwanted. The real prescribed flux (i.e. prescribed discharge multiplied by prescribed value of tracer) is then guaranteed. This is valid for Distributive schemes and SUPG.

OPTION OF SOLVER FOR... (OPTION DU SOLVEUR POUR...)

7 keywords, 1 for every solver. When selecting the GMRES method (7) for the solver, this key-word is the dimension of the Krylov space.

VELOCITY VERTICAL PROFILES (PROFILS DE VITESSE SUR LA VERTICALE)

Integer, the default value is 1
For every liquid boundary:

- 0: user defined profile
- 1: constant profile (as in previous versions)
- 2: logarithmic profile

In cases 0 and 2, **FUNCTION VEL_PROF_Z** is called and the velocities will be multiplied by its result. See example of logarithmic profile. Only the shape of the profile is important, as the velocities will be changed after to have a correct discharge.

TRACERS VERTICAL PROFILES (PROFILS DES TRACEURS SUR LA VERTICALE)

Integer, the value default is 1
For every liquid boundary:

- 0: user defined profile
- 1: constant profile (as in previous versions)
- 2: Rouse profile (so far only for sediment)

In cases 0 and 2, **FUNCTION TRA_PROF_Z** is called and the concentrations will be multiplied by its result. See example of Rouse profile. The resulting tracer discharge depends on the velocity profile.

INITIAL TIME SET TO ZERO (REMISE A ZERO DU TEMPS)

Logical, the default is NO
In case of a computation continued, to reset initial time to 0.

SUPG OPTION (OPTION DE SUPG)

Integers, the default values are 1;1;1;1
The option for SUPG upwinding, as in TELEMAC-2D.

- 1 is: upwind coefficient equal to 1
- 2 is: upwind coefficient equal to CFL number
- 1 is recommended if the CFL number is greater than 1.
- 2 is recommended if the CFL number is lower than 1 (it was the only option in previous versions).

The four numbers refer to : the velocity, the depth, the tracers, the k-epsilon model (as in TELEMAC-2D) BUT:

Only the first one is considered, because the SUPG matrix is built for all the advected variable. So, choose either:

SUPG OPTION : 1 or **SUPG OPTION : 2** only and it will stand for all

variables.

New user subroutine and modifications in user subroutines

FUNCTION VEL_PROF_Z

New **FUNCTION VEL_PROF_Z** for velocity profile on the vertical. Logarithmic profile is already programmed as option 2.

FUNCTION TRA_PROF_VEL

New **FUNCTION TRA_PROF_VEL** for tracer profile on the vertical

SUBROUTINE CORSTR

New **SUBROUTINE CORSTR** a new user subroutine for programming variations in time of the friction coefficient (called RUGOF). Does nothing if not user-modified.

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Last update: **2014/10/10 16:01**

