New general feature for v6p3 links from New version features

v6p1 Telemac-2D
New features of TELEMAC-2D v6.1

The main new features of this version 6.1 are:

- The coupling with Tomawac
- Bed roughness prediction
- Lateral boundary conditions improved
- Thompson boundary conditions now work in parallel
- Tidal model around France for automatic boundary conditions

Important notice:

von Karman constant has been set to 0.40 instead of 0.41

New or modified key-words :

"COUPLING WITH" (COUPLAGE AVEC)

Default : ''

TOMAWAC is now possible in this key-word and may be used also together with Sisyphe. It goes with the following key-word.

"TOMAWAC STEERING FILE" ("FICHIER DES PARAMETRES DE TOMAWAC")

Default : ''

Give the steering file of the corresponding Tomawac case. Both programmes will exchange wave forcing terms, velocities and depth. The coupling may be used with a period, Telemac-2D calling Tomawac only every N time steps, N being the next key-word.

"TOMAWAC COUPLING PERIOD" ("PERIODE DE COUPLAGE POUR TOMAWAC")

Default : 1

As explained above.

"COUPLING PERIOD FOR SISYPHE" ("PERIODE DE COUPLAGE POUR SISYPHE")

Default : 1

Replaces the old key-word "COUPLING PERIOD".

"VELOCITY PROFILES" ("PROFILS DE VITESSE")

There is now an option 5, which is based on option 4 (velocity profile proportional to the square root of the depth) but here the depth is a virtual depth computed with the lowest free surface of the boundary. As a matter of fact it has been observed that option 4 could lead to entering flows at places where a tidal flat would have been expected: after a flood entering velocities on the floodplain maintain a water depth, which maintains velocities, and so on, which prevents water from receding. Option 5 is thus recommended to concentrate velocities in the main channel, as long as the free surface in the main channel is lower than the floodplain.

"IMPLICITATION FOR VELOCITY" (IMPLICITATION POUR LA VITESSE)

was forced to 1 with the wave equation option in version 6.0 and this constraint has now been relaxed.

A visible effect is that when you ask a prescribed discharge, e.g. 500 m3/s, you will see in your listing that your discharge is only close to 500 m3/s, for example 499.67 m3/s, and may fluctuate with time. Actually velocities at time $t(n+1)$ are computed to give the right discharge, but the observed discharge includes fluxes due to velocities at time $t(n)$.

To get results as in version 6.0, you must then add the following line in your parameter file : IMPLICITATION FOR VELOCITY : 1.

"LAW OF FRICTION ON LATERAL BOUNDARIES" (LOI DE FROTTEMENT SUR LES PAROIS LATERALES)

Integer, default : 0 (no friction)

This is exactly like the LAW OF BOTTOM FRICTION.

The corresponding coefficient is the "ROUGHNESS COEFFICIENT OF BOUNDARIES" (COEFFICIENT DE RUGOSITE DES BORDS). However, as soon as coefficient AUBOR is given somewhere a non-zero value in the boundary conditions file, AUBOR will be taken instead as a spatially varying coefficient.

AUBOR is now a quadratic coefficient, and its meaning depends on the law of bottom friction chosen.

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

Integer, default : 1

1 : as before, priority to prescribed value in diffusion (subroutine cvdftr of library BIEF)

2 : priority to prescribed flux

Unlike in 3D there is a single value for all liquid boundaries. 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 finite volume schemes, i.e. options 3, 4, 5, 13, 14.

"FINITE VOLUME SCHEME" (SCHEMA EN VOLUMES FINIS)

integer, default: 0

old schemes:

0: Roe Scheme

1: Kinetic scheme order 1

2: Kinetic scheme order 2

new schemes:

3: Zokagoa scheme

4: Tchamen scheme

"NEWMARK TIME INTEGRATION COEFFICIENT" (COEFFICIENT D'INTEGRATION EN TEMPS DE NEWMARK)

double precision, default : 1.

1. : gives the classical explicit Euler scheme (order 1)

0.5 : gives second order in time (unconditionally stable)

Bed roughness prediction:

The bed roughness can now be given by Sisyphe when coupling is used. This is activated in Sisyphe by the logical keyword:

BED ROUGHNESS PREDICTION (PREDICTION DE LA RUGOSITE)

Which is set to .FALSE. by default. In case it is set to .TRUE. in Sisyphe, the friction law in Telemac-2D must be Nikuradse (option 5).

 TIDAL MODEL AROUND FRANCE

Full explanations by the author Chi-Tuân Pham to come in further updates...

Subroutine tidal_model_t2d.f can be added in the Fortran file, it includes a number of options that are commented and can be modified.

The original data are in file bdd.jmj, which corresponds to keyword 'TIDE DATA BASE' ('BASE DE DONNEES DE MAREE'). Harmonic constants are then extracted from this file and are put in a second file called 'HARMONIC CONSTANTS FILE' ('FICHIER DES CONSTANTES HARMONIQUES').

You can refer to test-case called modele_de_maree, it consists of two cases: cas1 where the harmonic constant file is dynamically built, cas2 where it is supposed to be already existing and is only read.

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