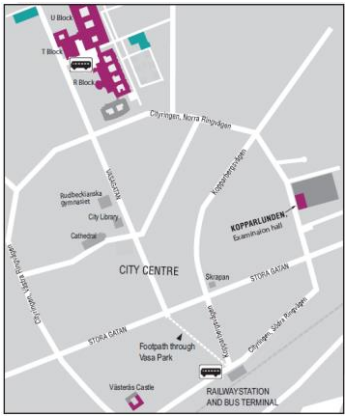
MÄLARDALEN UNIVERSITY
SWEDEN

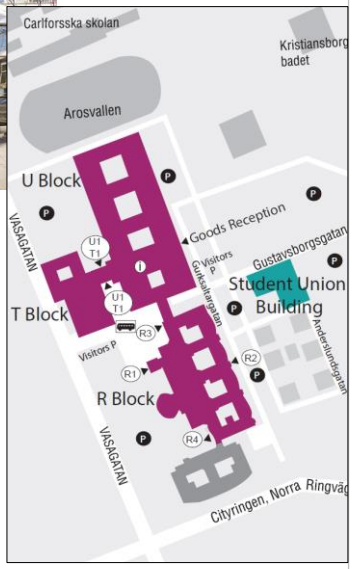
Universidad de Vigo

Mälardalen University
Högskoleplan 1, 722 20 Västerås, Sweden
The University is located near the city center and is about a fifteen-minute walk from Västerås Railway Station.


U-hus: library and entrance


Entrance



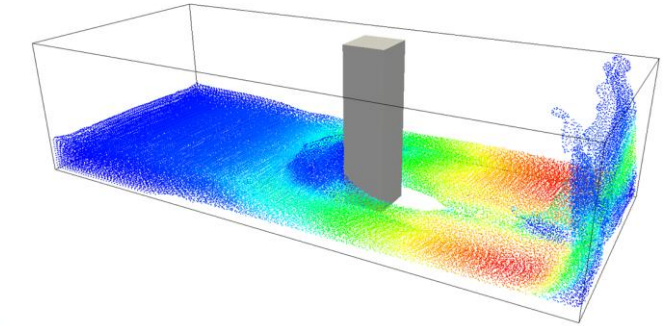


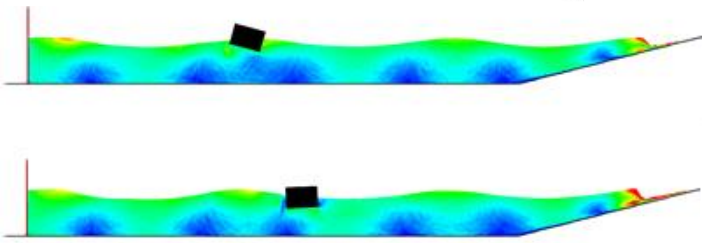
Beräkningsnätverket i Västerås

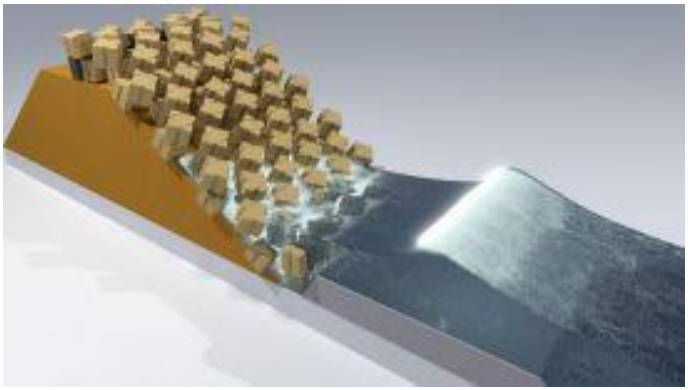
ABB

DualSPHysics

Introduction to Smoothed Particle Hydrodynamics & DualSPHysics







Mälardalen University
13th December 2018

MÄLARDALEN UNIVERSITY
SWEDEN

Presentation

The numerical modelling can represent a useful and complementary tool to physical model tests. Sophisticated tools are now at a formative stage and here we are actively developing the novel, flexible numerical technique Smoothed Particle Hydrodynamics (SPH). As a meshless and Lagrangian technique, SPH is ideally suited to fluid and solid mechanics with highly nonlinear deformation and is opening new avenues of activity in several areas, notably fluid-structure interaction, multi-phase flows and importantly, engineering application and design. SPH describes a fluid by replacing its continuum properties with locally smoothed quantities at discrete Lagrangian locations. SPH has become increasingly popular in recent years as a novel technique to model the violent hydrodynamics in wave breaking, wave-structure interaction, floating objects, etc.

The DualSPHysics code has been developed to use SPH for real engineering problems. DualSPHysics is open source and can be freely downloaded from the website www.dual.sphysics.org. The code comes with dedicated pre-processing software which can use a whole range of different input files for the geometries including CAD, STL, PLY files, etc., making setting up simulations straightforward. Advanced post-processing tools enable users to measure physical magnitudes of any flow property at arbitrary locations in the domain.

DualSPHysics code can be proposed as complementary tool to physical model experiments for the preliminary design of structures exposed to the action of violent flows

Contents of the course

The first part of the course will be focused on the general description of the SPH methodology, functionalities implemented in the DualSPHysics code and examples of application in coastal engineering and marine energies.

The second part includes a hands-on session with examples of dam-breaks, sloshing tanks and floating objects. This practical session includes pre-processing, execution and post-processing of the results (and validation with experimental data).

Organized by
Prof. Rebei Bel Fdhila (MDH/ABB)
Prof. M. Gómez- Gesteira (UVIGO)
Dr. A.J.C. Crespo (UVIGO)
Dr. J.M. Domínguez (UVIGO)
Dr. J. Gonzalez Cao (UVIGO)

Date and venue

The course (8 hours duration) will be 13th December 2018 at Mälardalen University, Västerås (Sweden).
8:30-12:15 in room **U2-129** (32 seats), U-Hus, Vån 2
13:45-18:00 in room **Ypsilon** (24 seats), U-Hus, Vån 2

Registration

If you are interested in attending the course, please contact Rebei Bel Fdhila: rebei.bel_fdhila@se.abb.com

Programme

08h30 Reception

09h00 Presentation of the course
Rebei Bel Fdhila
Moncho Gómez Gesteira

09h15 "Introduction to SPH"
Moncho Gómez Gesteira

10h00 Coffee break

10h30 "The DualSPHysics code"
José M. Domínguez

11h15 "Applications in engineering"
Moncho Gómez Gesteira

12h15 Lunch

13h45 "Introduction to Practical Session"
José M. Domínguez

14h00 "Practical Session: Simulation and Postprocessing"
José M. Domínguez, José Gonzalez Cao

18h00 Closure

This activity is funded by the Ministry of Economy and Competitiveness of the Government of Spain under project WELCOME (ENE2016-75074-C2-1-R) and by EU, JPI-Waterworks program, under project IMDROFLOOD (PCIN-2015-243)