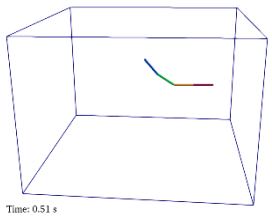
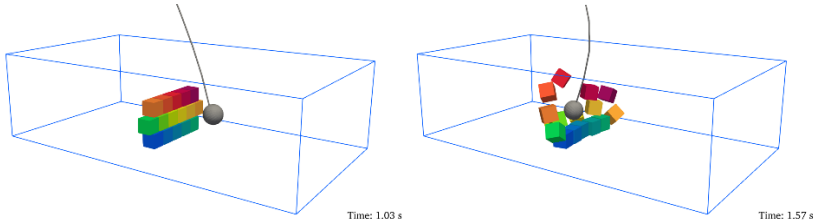
Testcases (main/chrono) included in the full DualSPHysics package v5.2 in http://dual.sphysics.org/index.php/downloads/

01_PENDULUM

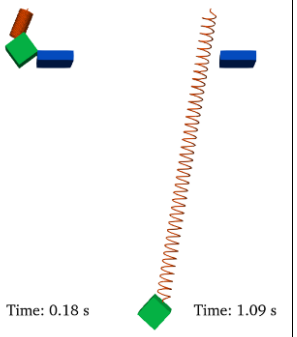
- Several bodies connected with a spherical link (hinge) to mimic a chaotic pendulum. Video
- Previous configuration + a spherical body linked at the end of the chain of bodies that will collide with blocks. Video

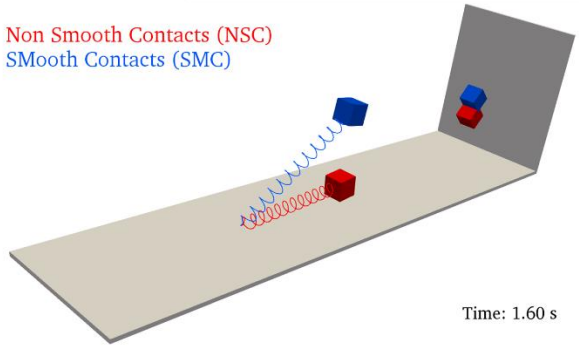




2_SPRING

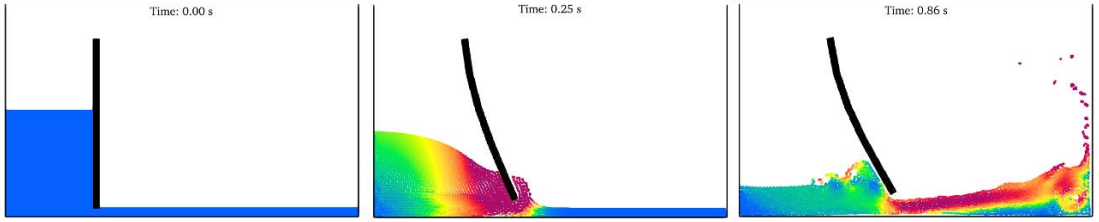
- A block is connected to a fixed point with the linear spring functionality. Video
- Two blocks are initially moved with predefined linear and angular velocity but one of them is connected to a linear spring. The collisions between the blocks and the tank are solved using the two contact methods defined in Chrono: Non Smooth Contacts (NSC) and SMooth Contacts (SMC). Video





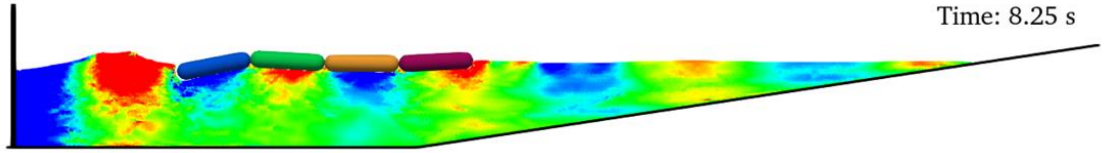
3_FLEXIBLEGATE

- 2-D flexible gate is emulated by linking rigid blocks with a series of hinges, with rotational rigidity and damped behavior. Video



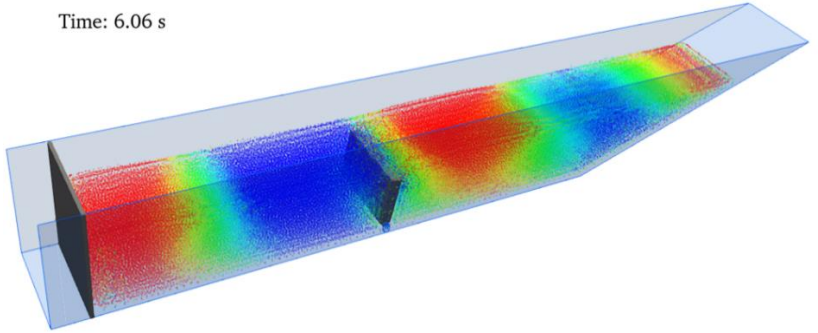
04_PELAMIS

- Several bodies connected with a spherical link (hinge) combined with a point line link. Video



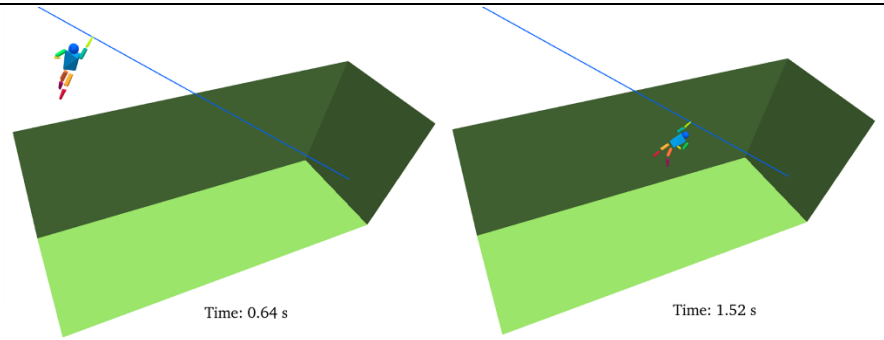
05_OWSC

- A mechanism subjected to waves is hinged to the tank bottom. Video



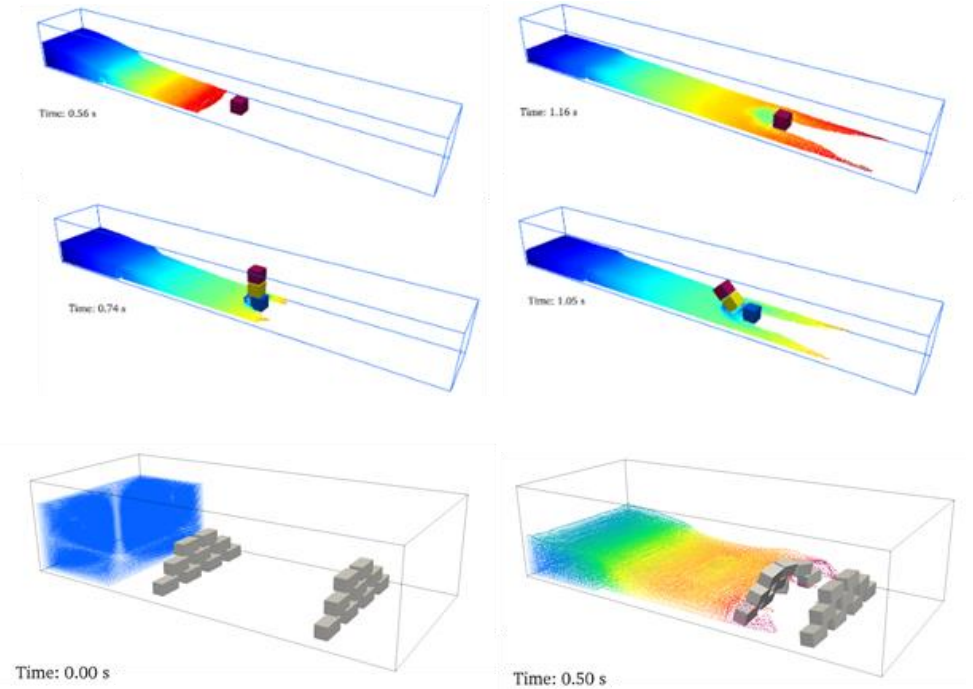
06_ZipLine

- A simplified ragdoll is defined: with one hand restricted by a point line link and with full self-collisions. Video



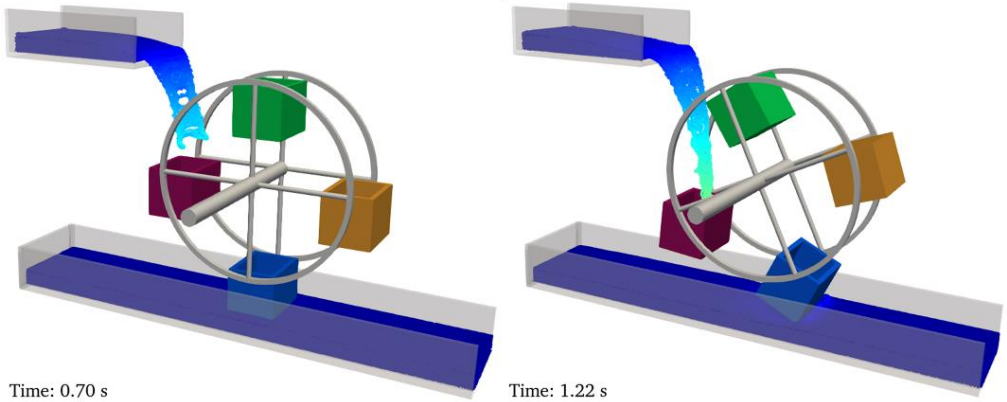
07_DambreakCubes

- 3-D dam break impacts with cubes (1 & 3) that interact between themselves and with the fixed boundary. Video & Video
- 3-D dam break impacts with several blocks that interact between themselves and with the fixed boundary. Video



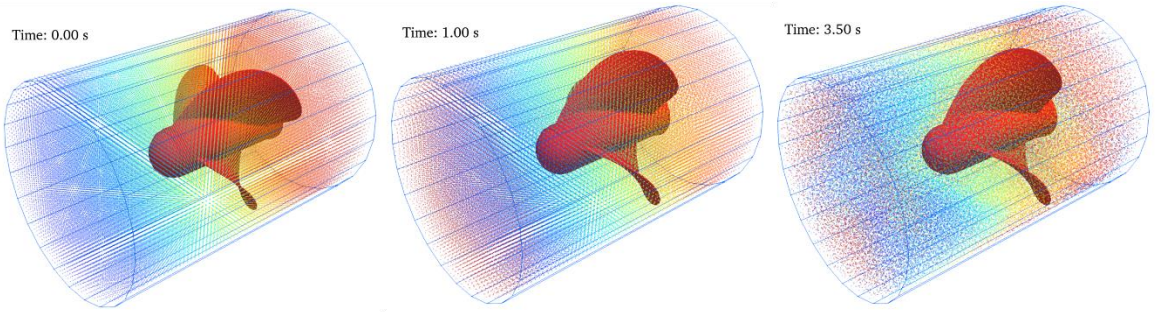
08_WaterMill

- Complex mechanism is designed with multiple links enabling relative motions, driven by the fluid or another object. Video



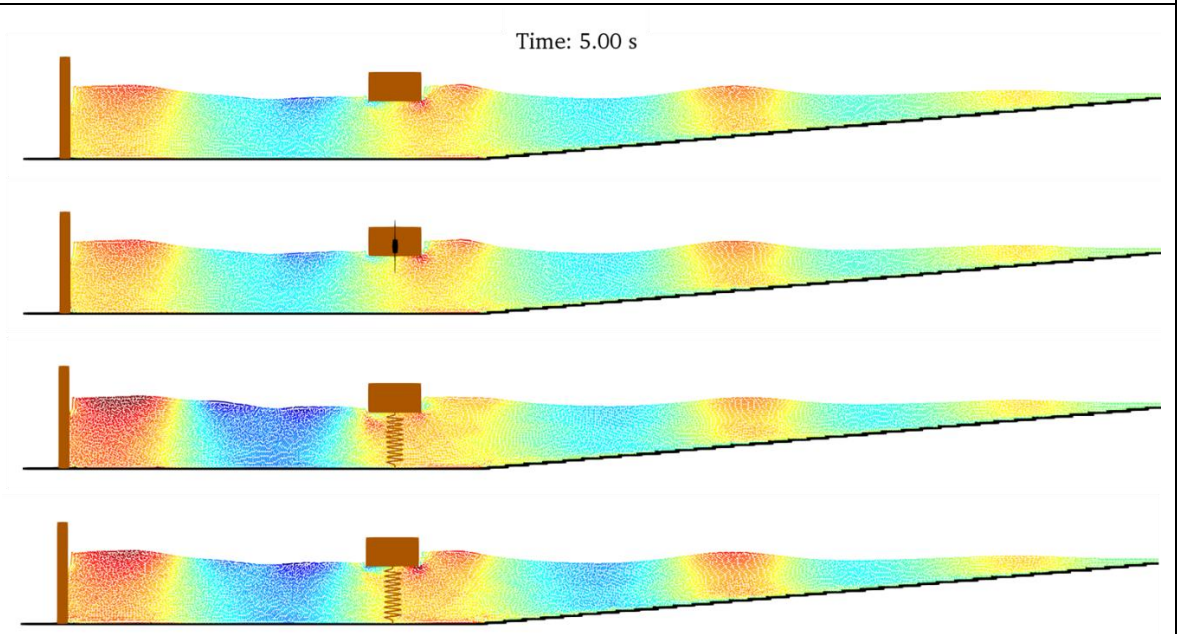
09_TURBINE

- A closed fluid circuit driven by gravity provides the necessary momentum to a hinged turbine to rotate. Video



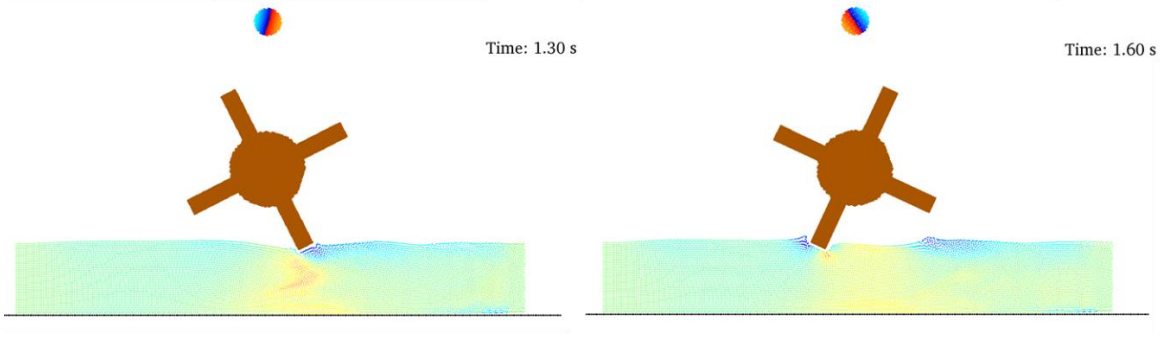
10_POINTABSORBER

- 2-D floating box under the action of regular waves is restricted to only-heave motion using Chrono (point line link) and using direct restrictions. Video
- 2-D floating box under the action of regular waves is restricted to only-heave motion using direct restrictions and simulating the Power Take-Off (PTO) system with a linear spring damper and using Coulomb damping. Video



11_CURRENTWHEELPULLEY

- 2-D current of 1m/s is generated using open boundaries. The fluid interacts with a hinged wheel that rotates freely. Video
- 2-D current of 1m/s is generated using open boundaries. The fluid interacts with a hinged wheel that rotates connected to a second rotating cylinder following the pulley link. Video



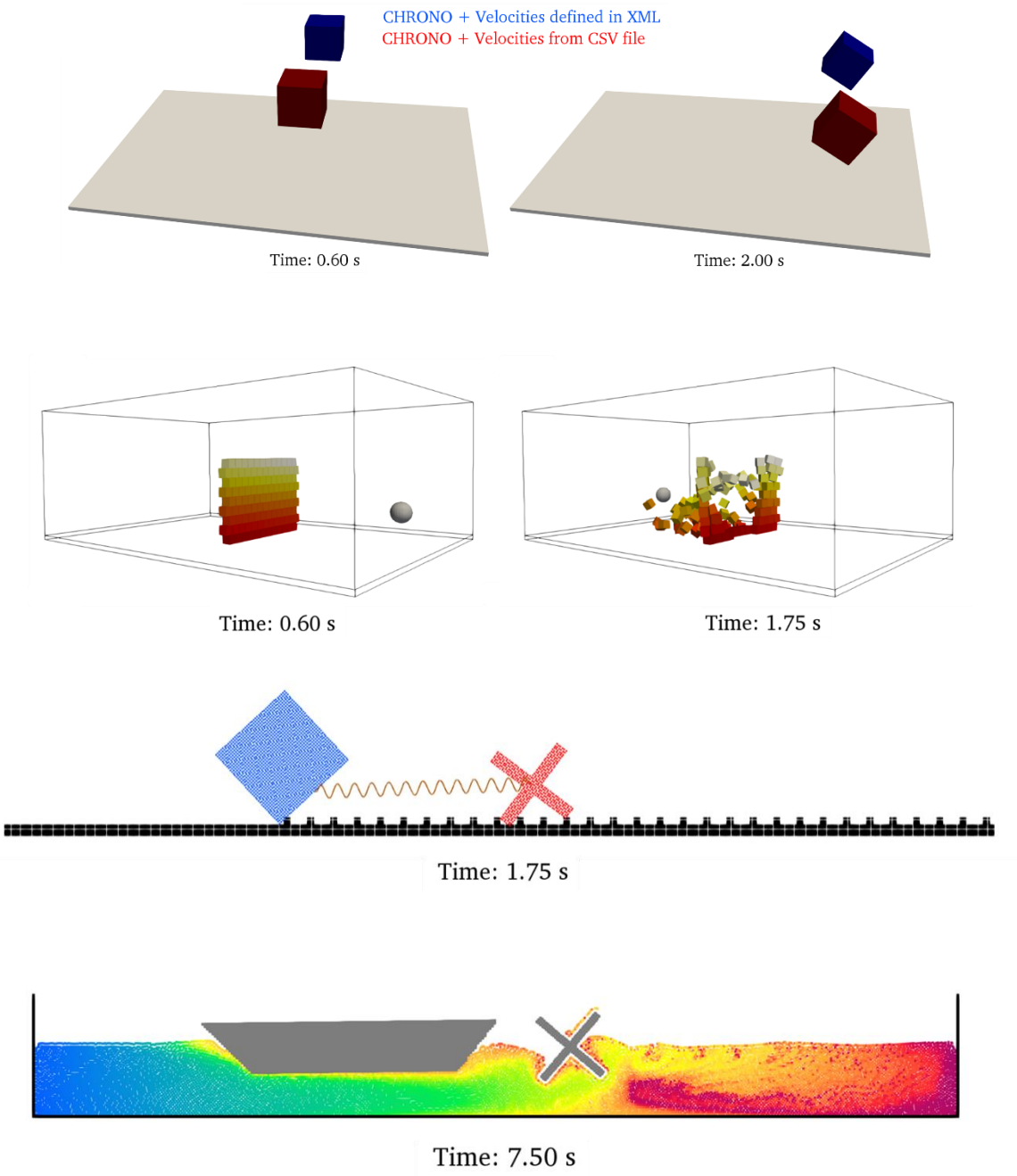
12_EXTERNALVELOCITY

- External velocities are imposed to floating objects that can also collide with the bottom. The linear and angular velocities are defined directly in the XML for one of the objects while the second one loads velocities from external CSV files. Video

- A predefined velocity is imposed to a ball that impacts with a wall created as a set of floating blocks. All the collisions are solved with the contact mechanism using single core or openmp. Video

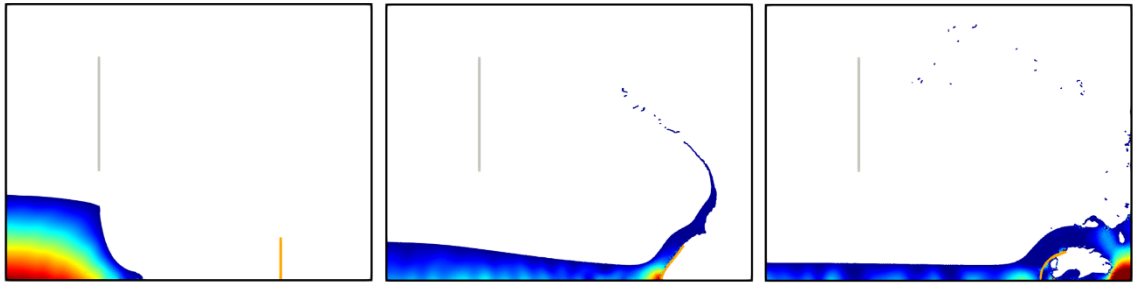
- Angular velocity is imposed on a cross-shape piece that rotates and moves along a toothed floor. The piece is connected to a big cube by means of a spring so that when it moves it also pulls the cube. Video

- Angular velocity is imposed on a semi-submerged propeller that rotates and moves along the wave flume. The propeller is connected to a ship by means of a hinge with the rotation axis of the hinge in the same rotation axis of the propeller. Video



13_FLEXIBLEOBSTACLE

- 2-D dambreak flow impacting a flexible obstacle based on a novel approach [Capasso et al. 2022] using the features available in the coupling with Project Chrono.
- Comparison with experimental results.
  Video



Time: 0.10 s | Time: 0.40 s | Time: 0.70 s