Article:

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Figure captions

Fig. 1 Influence domain of particle i in a minimum pressure model ($k = 2$, and h is the smoothing length).

Fig. 2 Comparisons of wave impact pressure time history on a vertical wall between SPH results and experimental data: (a) ISPH_APD; and (b) ISPH_Fick's law.

Fig. 3 Comparisons of ISPH time history computed with and without velocity interpolations: (a) velocity divergence; and (b) impact pressure.

Fig. 4 Geometry and initial velocity field of a vortex spin-down.

Fig. 5 Comparisons of particle distribution in a vortex spin-down at Re = 1000 and $t = 1.0$ s.

Fig. 6(a) Comparisons of horizontal velocity component computed by $N_x = 200$; and (b) Convergence test using different N_t.

Fig. 7 Comparisons of time history of maximum velocity: (a) computed by ISPH_APD, ISPH_MP and ISPH_MPAPD with $N_x = 200$; and (b) computed by ISPH_MPAPD with $N_x = 60$, 80, 100 and 200.

Fig. 8 Comparisons of pressure distribution computed by ISPH_MPAPD with total particle numbers at (a) $N_t = 3600$; (b) $N_t = 10000$; and (c) $N_t = 40000$.

Fig. 9 Comparisons between STAR-CD (Xu et al., 2009) and ISPH computed pressure profiles at $N_x = 200$.

Fig. 10 CPU time versus total particle numbers for different ISPH schemes.

Fig. 11 Schematic view of dam break flow impact on a vertical wall.

Fig. 12 Time histories of impact pressure at P_1 computed by ISPH_MPAPD using: (a) different time steps; and (b) different particle numbers.

Fig. 13 Comparisons of dam break flow in (a) water front; and (b) water column height with experimental data (Martin and Moyce, 1952).

Fig. 14 Particle distributions of dam break flow computed by: (a) ISPH_MP; (b) ISPH_ APD; and (c) ISPH_ MPAPD.

Fig. 15 Comparisons of pressure time history between experimental data (Zhou et al., 1999) and ISPH results.

Fig. 16 Schematic wave tank for solitary wave impact on a vertical wall.

Fig. 17 Particle distributions with pressure contour during solitary wave propagation: (a) standard ISPH; (b) ISPH_MP; (c) ISPH_APD; and (d) ISPH_MPAPD.

Fig. 18 Time histories of particle volume conservation for different stabilization schemes.

Fig. 19 Comparisons of wave surface profiles between analytical and ISPH results: (a) $t = 2.0$ s; and (b) $t = 3.1$ s.

Fig. 20 Comparisons of wave impact pressures between experimental data and ISPH results.

Fig. 21 Schematic wave tank for solitary wave impact on a slope.

Fig. 22 Comparisons between laboratory wave photographs (left), measured wave surface profiles (black dot) and ISPH_MPAPD particle snapshots (right).

Fig. 23 Particle distributions with pressure contours of solitary wave impact on a slope: (a) ISPH_MP; (b) ISPH_APD; and (c) ISPH_MPAPD at time $t = 7.1$ s (left) and $t = 7.25$ s (right).

Fig. 24 Comparisons of wave impact pressures between experimental data and ISPH results at measuring point: (a) P_1; (b) P_2; (c) P_3; and (d) P_4, with enlarged portions for different correction schemes in (a1) - (a3) and (b1) - (b3).

Fig. 25 (a) Schematic setup of wave flume for solitary wave impact and overtopping; (b) Locations of pressure measuring point on seawall (Hsiao and Lin, 2010).

Fig. 26 Comparisons of particle distribution with pressure contours computed by (a) ISPH_MP; (b) ISPH_APD; and (c) ISPH_MPAPD.

Fig. 27 Comparisons of time history of free surface profiles between experimental data (Hsiao and Lin, 2010) and ISPH results at: (a) G_3 (x = 7.6 m); (b) G_{10} (x = 9.644 m); (c) G_{28} (x = 10.732 m); and (d) G_{37} (x = 11.005 m).

Fig. 28 Comparisons of time history of wave impact pressures between experimental data and numerical results at: (a) P_1; (b) P_4; (c) P_7; and (d) P_8.

Fig. 29 (a) Schematic setup of numerical wave flume; (b) Locations of pressure measuring points on subface of horizontal structure.

Fig. 30 Particle distributions with pressure contours during wave slamming with experimental wave surface profiles (in dark red dots, by Gao et al., 2012): (a) ISPH_MP; (b) ISPH_APD; and (c) ISPH_MPAPD.

Fig. 31 Comparisons of time history of wave impact pressures between experimental data (Gao et al., 2012) and ISPH results at: (a) P_2; and (b) P_8, with enlarged portions for different correction schemes in (a1) - (a3) and (b1) - (b3).