23rd International Workshop in Water Waves and Floating Bodies
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Q/A Sheet

Title of Abstract: Active sound control using a floating flexible plate
Author(s): Avital, E. et al.

Question(s)

Name: R.W.Yeung

Question(s): I was not too sure how you plan to do your control of the pressure applied on the plate. It appears you may need to know or sense the pressure under the plate, but by then the sound is already reflected before you can apply a negative pressure. I don't think there is any problem if we are looking at steady-state situation, but the real application may be time-dependent.

Answer(s)

We optimize the steady state solution, which we know assuming we have far field measurements. It would be very interesting to do a time-dependent control, but this was not pursued in this work.

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Q/A Sheet

Title of Abstract: WAVE FORCES ACTING ON A SEMISUBERGED AQUACULTURE FISH CAGE
Author(s): Bao, W. et al.

Question(s)

Name: D. Evans

Question(s):

The difficulty here is finding all the roots of the complicated dispersion relation, and handling the case of double roots and branching. Also using trigonometric modes may lead to poor convergence near the edges at top and bottom.

Answer(s)

Certainly, the first comment you point out is the key of the present study. The present method of searching complex roots by systematically changing the parameters from $\sigma = 0$ is one of the effective ways to find all the roots. Nevertheless, it meets difficulties when two branches are too close. Presently, we start searching roots from a big value of when searching path is getting close to another one. A better treatment should be developed for this case.

Convergence is another criteria we should treat it carefully in the eigenfunction expansion method. We have checked it especially in case of $\sigma = 0$.

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Q/A Sheet

Title of Abstract: WAVE FORCES ACTING ON A SEMISUBERGED AQUACULTURE FISH CAGE

Author(s): Bao, W. et al.

Question(s)

Name: J.N.Newman

Question(s):

I expected that you could use three separate expansions (for r < a) and then match them on the two boundaries (z = -di) numerically. Can you comment on that?

Answer(s)

As a manner of fact, we started to solve the interior problem just like the way you pointed out and reached the present result. It turned out that only the eigenfunction of variable z should go through the procedures you mentioned.

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Q/A Sheet

Title of Abstract: WAVE FORCES ACTING ON A SEMISUBERGED AQUACULTURE FISH CAGE

Author(s): Bao, W. et al.

Question(s)

Name: T.Miloh

Question(s):

You apply a particular version of Darcy law for the normal velocity. This is certainly not a unique way to represent a B.C. across a porous boundary. I guess there is very strong dependence on the mesh size of the net as well as on its rigidity (elasticity). Is the calculation indeed sensitive to the particular choice of B.C.? Another question concerns satisfying continuity relation of amount of water entering and leaving the cage, i.e. a global in addition to a local condition. My last question concerns the value of d1 (depth below F. S.). Is there any limit on d1?

Answer(s)

We agree with your point about that the choice of B.C. relies on the mesh size of the net as well as on its rigidity (elasticity). At the present stage, the sensitivity of the alculation relative to the physics property of B.C. has not been checked. Your suggestion will be considered in the future work. For the second question, the mass conservation should be valid as long as the solution is valid without any corner and singular problems. Regarding to your last question, it should be treated even more carefully. We have to say that we don’t have reliable answer to it at the present moment. As an intuitive feeling, d1 could be zero, i.e. the upper porous plate is put on the F.S., as long as the simple Darcy assumption works.

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Q/A Sheet

Title of Abstract: Gap resonances in focused wave groups.
Author(s): Eatock Taylor, R. et al.

Question(s)

Name: X.B. Chen
Question(s): We've worked much on the same problem and remarked that the resonance peaks are very sensitive to mesh fineness. Is there convergent test in your investigation? Furthermore, unlike Newman's work(2005) in which a flexible lid is introduced over the gap area to reduce the free surface elevations there, we've implemented the method presented in Chen*(2004) by introducing a dissipation term in the boundary condition over the gap area(damping zone) to limit the unphysical high elevation of the free surface. However, the coefficient of dissipation is to be determined by comparing with model test results.
*Chen X.B. (2004) "Hydrodynamics in naval and offshore applications-Part I" keynote lecture presented in the 6th International Conference on Hydrodynamic, Perth (Australia)

Answer(s)

You are correct to ask about convergence, because I did not have time to cover this adequately in my presentation. We have in fact computed results for successively finer meshes, and I believe we have obtained satisfactory convergence for the linear problem. It should be noted that our DIFFRACT models use a quadratic boundary element idealization. Our experience so far is that the resonant frequencies appear to converge faster than the peak amplitudes. This has been highlighted by some second order computations we have recently undertaken for the twin barge geometry. In this case the mesh fineness near the barge corners is, not surprisingly, a particularly sensitive parameter in relation to the resonant elevation amplitudes predicted by this ideal flow theory.
Thank you for the details of your work on using a dissipation term in the boundary conditions over the gap free surface. I will be interested to see the consistency of comparisons with the model tests.

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Q/A Sheet

Title of Abstract: Gap resonances in focused wave groups.
Author(s): Eatock Taylor, R. et al.

Question(s)

Name: J.N.Newman

Question(s): In case it is of interest we have extensive plots of the gap elevations with varying levels of damping, in an obscure web reference:www.wamit.com/Report03.pdf (look on pages 33-44)

Answer(s)

Thank you very much. We haven't seen these, and will study them with interest.

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Q/A Sheet

Title of Abstract: Gap resonances in focused wave groups
Author(s): Eatock Taylor, R. et al.

Question(s)

Name: Michael Meylan
Question(s): Do the poles you used in the Matlab fit correspond to scattering frequencies?

Answer(s)

Poles are formed corresponding to all of the scattering frequencies observed in the range covered. Additional poles, however, are also formed to be necessary to provide good fits to the data. These additional poles are associated with large imaginary parts of the corresponding complex scattering frequencies.

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Q/A Sheet

Title of Abstract: 2D and 3D problem of internal-wave radiation by a body oscillating in a uniformly stratified fluid
Author(s): Ermanyuk, E.V. et al.

Question(s)

Name: T. Miloh
Question(s):
1. How did you manage to get a permanent linear density profile?
2. Was this profile stable both under heave and sway motions?
3. Can you please comment on the use of Schlieren technique for 3-D (sphere)?

Answer(s)

1. Linear density profile can be created by filling the tank with the help of so-called "double-bucket" technique (i.e. by pouring salt water from one bucket and constantly mixing some fresh water to this bucket from another bucket) or by creating a layered stratification which gradually evolves due to diffusion.
2. The profile is fairly stable under heave and sway. However, under circular oscillations, secondary currents eventually build up sharp interface in the vicinity of the cylinder. In general, orbital motion of a cylinder produces strong stirring in the near region.
3. I am fairly confident about using 3-D Schlieren for academic problems with simple geometry. For the axisymmetric case (vertical oscillations) and for the case when azimuthal distribution of perturbation is a known function (for field for horizontal oscillations), the homographic inversion is a well-posed problem. Inversion can be performed for images recorded with a single camera. However, I am pessimistic about using 3-D Schlieren in a general case where the problem is ill-posed.

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Q/A Sheet

Title of Abstract: Wave trapping by freely-floating circular cylinders
Author(s): Evans, D.V. et al.

Question(s)

Name: M.Kashiwagi

Question(s): This paper is related to the perfect reflection(or transmission) condition for the case of freely floating. I think it is already known through a work of prof.Bessho that the reflection and transmission coefficients for the freely floating case can be given only in terms of the phase of symmetric motion(heave) and that of Antisymmetric motion(sway and roll). From those expressions, the condition of perfect reflection(or transmission) is well known.

Answer(s)

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Q/A Sheet

Title of Abstract: Wave trapping by freely-floating circular cylinders
Author(s): Evans, D.V. et al.

Question(s)

Name: Michael Meylan
Question(s):

1. How do you solve for a cylinder next to a wall ?
2. Have you proved a trapped mode exists or shown numerical evidence ?

Answer(s)

1. We use the method used by Ursell in his 1984 paper on the heaving of a single half-immersed circular cylinder. But here we need a combination of wave-source and wave-free potentials at the image point of the cylinder in the wall and this causes difficulties in applying the boundary condition on the cylinder. We have to transfer the trigonometric function from the image point to the real cylinder center and the details are complicated.
2. The complete reflection of an incident wave at a particular frequency by heaving and swaying cylinders provide strong evidence of motion trapping for two such(mainly spaced) cylinders. The full theory provides two condition to be satisfied simultaneously and this is shown numerically in the intersection of the curves $C_1^w - C^w$ and $C_2^w - C^w$.

Many people regard this as a rigorous proof – thus may require something less dependent on numerical computation.

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Q/A Sheet

Title of Abstract: Recent advances toward the viscous flow simulation of ships maneuvering waves
Author(s): Ferrant, P. et al.

Question(s)

Name: H. Bredmose
Question(s): Do you take the feedback from the RANS solver to the potential flow? – and how?

Answer(s)

In the SWENSE formulation, no feedback from the RANSE solver to the potential flow is needed as all the boundary condition of the initial problems are accounted for in the modified RANS solver.

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Q/A Sheet

Title of Abstract: Recent advances towards the viscous flow simulation of ships maneuvering waves
Author(s): Ferrant, P. et al.

Question(s)

Name: Jone Grue

Question(s): First, let me congratulate you with your successful application and implementation of the SWANSE method. My question regards the 2nd order force computation you showed, and compared to measurements performed in myself and Huseby, JFM(2000). There were no parasitic waves in these experiments, in the sense that we switched off the force measurements when 2nd harmonic free waves and reflection from the beach appeared at the cylinder. The input wave was documented by 1250 different experiments, see figures in the JFM publication. My point when it comes to the 2nd harmonic force, is that this has a slow build-up, observed in the experiments. The other harmonics are more caused by the wave scattering with significant contribution from the waterline. In your computation – from 10 years ago - !

a) did you observe the build-up of the 2nd harmonic force in your calculation?

b) did you perform another set of numerical experiments with a larger physical domain, i.e. checked convergence?

Answer(s)

Thanks for your nice comment and for your question. Although in 10 years ago I sufficiently worked on these simulations to remember that there was no show built-up of 2nd order load components, as you mentioned in your experiments. Stable 2ω terms were very quickly obtained and remained constant even for simulation up to 20 incident wave periods.

Then, as you saw your experiments such as to avoid the influence of 2ω parasitic waves from the wave-makers(absent from my regular stream function model) and that my results nicely tend to 2nd order modeling when ka-> 0, I have no other solution than considering that the difference mainly from the presence of side walls in the experiments that were not accounted for in my simulation.

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Q/A Sheet

Title of Abstract: Recent advanced towards the viscous flow simulation of ships maneuvering waves
Author(s): Ferrant, P. et al.

Question(s)

Name: Eldad Avital, Queen mary Univ. UK
Question(s): Very interesting presentation, my interest is how successful the URANS calculation for the cylinder were in capturing the side force and the shedding frequencies

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Answer(s)

Calculation I showed referred to a truncated vertical cylinder in regular waves, in the diffraction regime, with a low Keulegan-Carpenter number. Viscous effects were negligible, and especially no separation occurred. Transverse loading was thus close to zero

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Q/A Sheet

Title of Abstract: Passive trapping structures in the water wave problem
Author(s): Fitzgerald, C. et al.

Question(s)

Name: Mike Meylan
Question(s): Can you excite the passive motion by an initial displacement.

$$\xi(x,t) = \mathrm{Re}\left\{ \frac{1}{N} \left(\int_F \xi_0 \phi_0^* \right) \phi_0 (x, \omega) e^{i\omega_0 t} \right\}$$

where N :normalization, ϕ_0 :passive motion, ω_p :frequency?

Answer(s)

It will be straight forward to investigate if this is possible – simply running the time-domain code with $\zeta(x,0) \neq 0$ between the structures should prove whether such excitation is possible. However it won't be as easy as for the pressure-forcing case to obtain an analytic proof why the mode should be excited.

If the mode is excited, an attempt to predict the free-surface displacement could be made(ϕ_0 ; $\frac{\psi(x,z)}{\omega - \omega_0}$ can be used)
However, the difference between a scattering problem formulation and a freely-floating structure formulation (even if $\frac{\partial \phi_0}{\partial n} = 0$ at $\omega = \omega_0$) may mean the prediction will contain same errors

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Q/A Sheet

Title of Abstract: Numerical simulation of breaking waves using VOF
Author(s): Greaves, D.

Question(s)

Name: E.Avital
Question(s): Very interesting and difficult problem. We used V-VOF and FCT-VOF, LES of flow around free-surface piercing cylinders. Have you tried PLIC-VOF ? It may improve your results and reduce some of the jet spray.

Answer(s)

Thank you for your suggestion. I tested different surface capturing methods, including PLIC-VOF, SURFER-VOF and CICSAM-VOF (used here), for same classic interface advection benchmark cases and CICSAM-VOF gave the best results.
Ref : Greaves, D.M. 'A quadtree adaptive method for simulating fluid flows with moving interfaces', Journal of computational physics, 194/1, pp35-56, 2004

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Q/A Sheet

Title of Abstract: The effect of surface tension on localized free-surface oscillations about surface-piercing bodies
Author(s): Harter, R. et al.

Question(s)

Name: D. Evans
Question(s):
By including surface tension you have introduced extra freedom in your calculation. Is it possible that you could use this to extinct a fixed single trapping structure for the first time – which would of cause have to violate John's (not readable word here) for uniqness ?

Answer(s)

I think that this might be possible. However, this type of configuration would have to arise from an antisymmetric velocity pontential, and it is known that the antisymmetric potential mentioned briefly in McIver (1996) (with S=0) does not give a single surface piercing body. Nevertheless, there is plenty of more for investigation. For non-zero values of interface term, the John condition still holds when either the pinned-edge or zero-slope contact-line condition are applied, and if an isolated body could be constructed whilst utilitising the former condition, then this body would indeed violate the condition.

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Q/A Sheet

Title of Abstract: Second order solution of circular disc impact problem
Author(s): Iafrati, A. et al.

Question(s)

Name: T. Miloh

Question(s):

The solution for the zeroth-order potential is well known and credit should be possibly given to Horace Lamb. This function can be also expressed in terms of the Legendre polynomial of the 2nd-kind. It is indeed a brave attempt to extend the solution formulated in terms of spheroidal coordinates to next order, but can we still apply the B.C. on the undisturbed Z=0 plane?

Answer(s)

You are really right, the first order velocity potential is given in the book of Horace Lamb. The stream function of the flow through on surface. Concerning with the second part of your question, the boundary conditions are applied on the undisturbed water level only for the outer solution. In a previous work we obtained the first order inner solution and in that case we solved the fully non linear problem and the B.C. were applied onto the real free surface shape. In this sense the inner solution is affecting the outer solution through the constant “C” in the expansion. This constant was obtained together with the free surface shape for the inner problem in Iafrati and Korobkin (2004).

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Q/A Sheet

Title of Abstract: Experimental & numerical investigation of wave impact on a vertical wall

Author(s): Jensen, A.

Question(s)

Name: Ken Takagi

Question(s): It is very difficult to synchronize computation with the experiment, since the impact is very sensitive to the free surface shape. How did you decide the start time of the computation ?

Answer(s)

I totally agree. We are using a numerical wave tank which is similar to the physical one. The start time of the computation is the same as the experiment. The simulation use the measured paddle displacement as input.

Q/A Sheet

Title of Abstract: An experimental study of shallow water impact
Author(s): Kang, H.D. et al.

Question(s)

Name: R.W.Yeung

Question(s): Thank you for sharing with us these well-planned experiments. From the results shown, it appears that the square-corner cylinder has a flow that is best described by using a Kutta-like condition, whereas the circular cylinder, the flow stays attached to the curved surface for a significant amount of time. Do you agree with this major difference in the 2 types of flows ?

Answer(s)

Thank you for your pointing that out. I completely agree with you.

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Q/A Sheet

Title of Abstract: An experimental study of shallow water impact
Author(s): Kang, H.D. et al.

Question(s)

Name: H. Bredmose
Question(s): The oscillatory pressure measured beneath the plate – are they due to structural vibrations or trapped air?

Answer(s)

The oscillatory pressure seems to be induced by the structural vibrations

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Q/A Sheet

Title of Abstract: Experimental confirmation of reciprocity relations of waves around an asymmetric floating body
Author(s): Kashiwagi, M.

Question(s)

Name: R. Eatock Taylor
Question(s): I am wondering about the possible influence of non-linear dispersion on your results. Even in small waves it would be that small phase differences linked to nonlinear dispersion would cause significant effects on the sensitive calculation of reflected and transmitted waves(as measured at some distance from the body). Testing over different ranges of wave steepness might perhaps highlight any such influences.

Answer(s)

I suppose the nonlinear dispersion relation(phase velocity) may affect the phase difference between the incident and reflection waves, not the amplitude of the wave.
Looking at the phase of reflection and transmission waves, we can observe a slight difference between measured and computed results. I think we should check the influence of nonlinear dispersion mainly in the phase of the reflection wave.

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Q/A Sheet

Title of Abstract: Experimental confirmation of reciprocity relations of waves around an asymmetric floating body

Author(s): Kashiwagi, M.

Question(s)

Name: Harry Bingham

Question(s): When you calculate the incident and reflected waves, do you normalize by the calculated incident wave amplitude or by the target wave amplitude? How close are the two values?

Answer(s)

We measured only incident wave without body, the amplitude of which was compared with the corresponding value obtained by the analysis for separating the incident wave and reflection wave. We confirmed that the agreement was good enough so that there is only negligible difference and we could not discern the difference in figures whichever amplitude we would use.

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Q/A Sheet

Title of Abstract: Experimental confirmation of reciprocity relations of waves around an asymmetric floating body

Author(s): Kashiwagi, M.

Question(s)

Name: Hang S. Choi

Question(s): Would you tell us the wave length relative to the channel depth when waves are attenuating significantly?

Answer(s)

The wave attenuation was prominent at higher frequencies, say, than $Kb = 1.5$ (where b is half length and 0.15m in the model used). A rough estimation of the wave length at $Kb = 1.5$ gives $\lambda = 0.628m$. Since the water depth was $h = 0.4m$, we can say that the effect of channel depth was negligible at least at frequencies higher than $Kb = 1.5$.

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Q/A Sheet

Title of Abstract: Verification of the method of flat cross-sections for the case of jet impact onto elastic plate
Author(s): Khabakhpasheva, T. I.

Question(s)

Name: Ken Takagi
Question(s): Sometimes we need stream line for an engineering purpose. Can you calculate the streamline? I suppose that if you use 2D potential as 3D potential, you may get 3D streamline. It must be interesting.

Answer(s)

I have not taken into account real form of streamline, because I consider only initial stage of the impact and simple approach, when jet (and jet cross-section) conserve they form during all the time considered.

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Q/A Sheet

Title of Abstract: The effect of tank sloshing on LNG vessel and floating terminal response
Author(s): Lee, S.J. et al.

Question(s)

Name: Ken Takagi
Question(s): Do you keep the draft of the ship in your calculation while you change the loading condition of LNG?

Answer(s)

For convenience, it is assumed that the waterline remains the same for different liquid tank fill ratios by adjusting ballast

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Q/A Sheet

Title of Abstract: The effect of tank sloshing on LNG vessel and floating terminal responses
Author(s): Lee S.J. et al.

Question(s)

Name: Harry Bingham
Question(s): You have focused on the moored ship problem, although you mentioned the possibility of the vessel sailing with partially filled tanks. Which case do you expect to be most dangerous : moored or sailing? Are you able to take the forward speed effect into account in your solution?

Answer(s)

If time-domain ship-motion program including forward –speed effect is available, the same coupling technique can be applied. The offloading operation with mooring is to be done in relatively mild sea conditions, while sailing has to go through a variety of weather conditions. In this sense, the sailing condition may be more dangerous. The coupling effects, however depend on the location of peaks in RAOs and incident wave spectrum, so case by case

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Q/A Sheet

Title of Abstract: Scattering by arrays of bottom mounted cylinders and the approximation of near trapping in the time domain.
Author(s): Meylan, M.H. et al.

Question(s)

Name: D.V. Evans
Question(s): Is it true that your approximate technique depends on knowing a priori the expected position of the complex poles near the real axis in a particular configuration of cylinder?

Answer(s)

We know from Porter&Evans 1997 that symmetric arrangements of cylinder lead to complex poles near the real axis. For any given arrangement we calculate the location of the poles using a numerical method we have developed.

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Q/A Sheet

Title of Abstract: Linear analysis of wave basins and absorbers
Author(s): Newman, J.N.

Question(s)

Name: T. Miloh
Question(s): Can you please comment on the uniqueness problem in the case of multi-absorbers? Is there a single solution for the motion and phase of each absorber without optimizing a certain cost function (say the energy input to move the absorbers)?

Answer(s)

Assuming the existence of an optimum solution with no reflected waves, the question of uniqueness is equivalent to asking if there can exist a non-zero motion of one or more wavemakers with zero wave amplitude in the basin. (In this context we should exclude evanescent motions near the wavemakers.) It seems clear that if one wavemaker by itself radiates nonzero waves, then it is impossible to cancel these waves by the motions of other wavemakers at different positions and the combination of any two or more wavemakers must be a nonzero wave system. Although this is not a rigourous proof of uniqueness it does imply that the solution for optimum wave absorption is indeed unique. It is possible of course to design the wavemakers such that each one by itself will radiate zero waves, for example by putting the hinge axis at a suitable position below the free surface and above the bottom of the wavemaker. But this situation is of no practical interest if the wavemakers are to be used to generate and absorb waves, so it can be excluded from our consideration.

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Q/A Sheet

Title of Abstract: Linear analysis of wave basins and absorbers
Author(s): Newman, J.N.

Question(s)

Name: H. Bredmose
Question(s): Is it possible to extend this method to nonlinear waves? How would one do, if so?

Answer(s)

Possibly a 2nd order perturbation expansion would be possible in the frequency domain. Otherwise the nonlinear analysis could be performed in the time domain for example with a spectral method or Rankine BIEM, but it would seem very difficult to optimize the absorber control

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Q/A Sheet

Title of Abstract: A fully nonlinear numerical model for focused wave groups
Author(s): Ning D.Z. et al.

Question(s)

Name: J.N.Newman

Question(s): Please comment on the comparison between your nonlinear results and linear theory

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Answer(s)

Comparison with linear theoretical results, the nonlinear results presented in the study are much different from these. For the wave elevations at the crest and trough focal point, there is no difference between linear crest and minus trough focused surface elevations. But nonlinear characteristic, higher and narrower wave elevation at crest point, narrower and broader wave elevation at trough point, are shown clearly in nonlinear results. There are similar phenomena between linear and nonlinear results for velocity distribution.

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Q/A Sheet

Title of Abstract: A fully nonlinear numerical model for focused wave groups
Author(s): Ning D.Z. et al.

Question(s)

Name: Hang S. Choi

Question(s): The difference in particle velocity at the crest and trough indicates the nonlinear effect. Did you validate your numerical results?

Answer(s)

Yes, I validate the nonlinear results by comparison with the 2nd-order analytical solution. Good agreements are obtained.

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Q/A Sheet

Title of Abstract: Time dependent interaction of water waves and a vertical elastic plate
Author(s): Peter, M.A. et al.

Question(s)

Name: T.Miloh
Question(s): The near-resonance condition in this case will be given (in most cases) in terms of a complex value of the wave number. Using the dispersion relation this will correspond to a complex resonance frequency which can be Fourier inverted into a time domain.

Answer(s)

This is exactly what we have made use of for approximating the long-time behavior. The single-frequency solution operates is singular at the complex scattering frequency. Using an approximation near this frequency, the inverse Fourier transform can be approximated by the residues at this frequency. As we have shown, this simple approximation yields very good agreement with the full solution after a transient time.

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Q/A Sheet

Title of Abstract: Time-dependent interaction of water wave and a vertical elastic plate.
Author(s): Peter, M.H. et al.

Question(s)

Name: Harry Bingham
Question(s): In your example of reflecting a wave packet from the pinned plate you are left with waves radiating to infinity and slowly decaying. Visually it looks like you are generating extra energy, have you cheeked the energy conservation at there results?

Answer(s)

This impression may be due to the different horizontal (-12, 2) and vertical scalar (-1,1). We only check for energy conservation for the time-harmonic solutions and it is a good idea to do this for the time-dependent calculations as well. We well include this in our code.

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Q/A Sheet

Title of Abstract: Time-dependent interaction of water waves and a vertical elastic plate.
Author(s): Peter M.A. et al.

Question(s)

Name: D.V. Evans

Question(s): Is it possible, by considering a different set of boundary condition at either end of the vertical plate, that you could generate a motion trapped mode at a particular frequency?

Answer(s)

It is quite simple to modify our code in order to work with other boundary conditions, including unphysical cases such as free boundary conditions at the sea bed, and it might be possible to generate a motion trapped mode in this way. However, our method does not provide any means to find the parameter set corresponding to such a motion trapped mode.

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Q/A Sheet

Title of Abstract: Time-dependant response of a heterogeneous elastic plate floating on shallow water
Author(s): Sturova, I.V.

Question(s)

Name: T. Miloh
Question(s): Since you are planning to extend your 2nd order shallow water solution for circular discs you should compared your numerical results against the exact solution found by Zilman and Miloh for an homogeneous plate. As far as I know this is the only 3d(axisymmetric) case which still can be solved analytically.

Answer(s)

I'll use my results about unsteady behavior of homogeneous circular plate under external loading(see, for example, IWWWFB 2003). The linear shallow water is applied.

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Jeju, Korea

Q/A Sheet

Title of Abstract: Hydroelastic behavior and fatigue damage of a very large mobile offshore structure in a realistic sea condition
Author(s): Takagi, K. et al.

Question(s)

Name: H. Bredmose
Question(s): Has there been made physical model test?

Answer(s)

We have carried out an experiment with 5m model to investigate hydroelastic motion. We also planning to conduct another experiment using 5m model with sails and wind turbines to the maneuverability.

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Q/A Sheet

Title of Abstract: Hydroelastic behavior and fatigue damage of a very large mobile offshore structure in a realistic sea condition.

Author(s): Takagi, K. et al.

Question(s)

Name: R.W. Yeung

Question(s): Thank you for a comprehensive talk. There are two questions.

(1) What is your colleagues estimate of the $/kwh of such a wind-turbine system?

(2) It appears that at strong wind of 30kts or higher, a 130m diameter turbine will have such large toppling moment that 20m draft hull might be inadequate. Is this a verified design, published some where?

Answer(s)

(1) My colleagues estimate of the cost is about 0.1 $/kwh

(2) Since the structure has very large displacement compared to the drag force of the wind turbine, the structure is stable in wind of 2.5m/s. The detail can be found in the report of the project.

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Q/A Sheet

Title of Abstract: Hydroelastic behavior and fatigue damage of a very large mobile offshore structure in a realistic sea condition.

Author(s): Takagi, K. et al.

Question(s)

Name: Harry Bingham

Question(s): How do you transmit the energy back to shore?

Answer(s)

The energy is converted into hydrogen and transferred by shuttle tankers.

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Q/A Sheet

Title of Abstract: Some aspects of whipping response of container ships
Author(s): Tuitman, J. et al.

Question(s)

Name: Michael Maylan
Question(s): Is the body motion linear? Is the wave force linear or non-linear? How does this relate to the calculation of K?

Answer(s)

The body motions are not linear. Large amplitudes of the ridged body modes are allowed. Transformations between the earth and body reference systems are done using Euler transformations. However the amplitudes of the flexible modes are assumed to be small. This assumption holds for normal ships. Some components of the wave excitations are kept linear others are non-linear. The diffraction and radiation are calculated using linear coefficients calculated in the frequency domain. The Froude-Kriloff and hydrostatics are calculated non-linear in the time domain. The slamming excitation is a highly non-linear forces and is based on the actual position, velocity and acceleration of the body. K is a so called memory function that will account for the radiation forces. The function K is linear and obtained using the frequency domain damping. As a convolution between K and the non-linear velocities is calculated, the result of this convolution integral is also non-linear.

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Q/A Sheet

Title of Abstract: Some aspects of whipping response of container ships
Author(s): Tuitman, J. et al.

Question(s)

Name: Hang S. Choi
Question(s): Would you explain why Weibull distribution is taken for extreme bending moments? In other words, is there any definite evidence or reason that Weibull distribution is the best choice.

Answer(s)

The Weibull distribution is used because this distribution is used by many authors for fitting the bending moment distribution. To the authors knowledge there is no clear evidence that the Weibull distribution is the best to use, but there is also no evidence that an other distribution would give better results. The linear bending moment signal is normally narrow-banded and will comply to the Rayleigh distribution. The Weibull distribution is a generalization of the Rayleigh distribution and should be valid for the linear signal. The non-linearities will change the shape parameter of the Weibull distribution, which indicates that it is not Rayleigh distributed anymore. The highest extremes usually give a straight line in a Weibull plot which indicate that the Weibull distribution for those extremes holds. But that is not a evidence that the extrapolation should also comply to the Weibull distribution. This can only be validated by doing very long simulations to be able to evaluate the distribution of the extremes in the extrapolated region.

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Q/A Sheet

Title of Abstract: Similarity solution for wedge-shaped fluid/structure impact
Author(s): XU, G.D. et al.

Question(s)

Name: L.J. Doctors

Question(s): Thank you for the interesting presentation. I understand that you ignore gravity, as is usual, and that this is reasonable when the impact velocity is high. However, there must be some cases where gravity plays a significant role. Can you please comment on this?

Answer(s)

This paper only focuses on the initial stage of the impact. While, $T/g<<1$, the gravity effect has been ignored. For larger time scale, a time domain simulation can be carried and the gravity term should be included.

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Q/A Sheet

Title of Abstract: Similarity solution for wedge-shaped fluid/structure impact
Author(s): XU, G.D. et al.

Question(s)

Name: A. Korobkin
Question(s): How long is the calculation boundary, the size of SF?

Answer(s)

The immerged distance be 1 unit, the control boundary for array from the impact zone is about 20 units.

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Q/A Sheet

Title of Abstract: Interference drag of multiple pressure cushion
Author(s): Yeung, R.W. et al.

Question(s)

Name: L.J.Doctors
Question(s): Thank you for your paper with the interesting theoretical results using multiple cushions. Have you considered doing experiments in order to test the theory ?

Answer(s)

We have something planned for the di-cushion scenario. However, we have received a report from NTNU of Norway and may be able to use some of the data. Thank you for your comments.

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Q/A Sheet

Title of Abstract: Interference Drag of Multiple Pressure Cushions
Author(s): Yeung, R.W. et al.

Question(s)

Name: M. Kashiwagi
Question(s): How do you determine the pressure distribution for a general shallow-draft ship to satisfy the body boundary condition? I suppose you have to solve an integral equation, which may not be so practical as compared to the thin-ship theory.

Answer(s)

Thank you for your question. The air-cushion vehicles considered in this paper are restricted to the situation of an applied pressure on the free surface, as is the case of a 'hover craft'. The applied pressure is considered known and is related to the craft's displacement. Hence, there is no integral equation to solve for the pressure.

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Q/A Sheet

Title of Abstract: Shallow-water wave propagation over slowly varying bathymetry using higher order Boussinesq equation
Author(s): Yuck, R.H. et al.

Question(s)

Name: Jone Grue
Question(s): General of your numerical experiments, following your hard studies and work, compare very favorably with experiments. My question related to the limitation of the method, where it, perhaps, gives less satisfactory results. Are you aware of those ? Maybe you can also comment on potential generalization of your work. Are you planning to analyze the motion of ships in shallow water? And how will you proceed?

Answer(s)

Limitation ; $kh = 12 \sim 20$: for mild slope condition
$kh = 6 \sim 12$: for steep slope model (Ref. paper by Madsen, 2006, Coastal Eng.)

Computational domain (nonlinear calculation), Wave maker zone (linear wave)
=> this make some error on nonlinear shoaling problem

Application to floating bodies : Hybrid Boussinesq-BEM method

Boundary condition in BEM for diffraction : $\frac{\partial \phi}{\partial n} = -\frac{\partial \phi_I}{\partial n}$; V_n <- given by Boussinesq solution

F.K. : $P = -\rho \frac{\partial \phi}{\partial t} = \rho g \eta$ <- given by Boussinesq solution

V_n :Vertical profile of velocities can be obtained by my solution
This method will be limited to weakly nonlinear problem.