



City Research Online

City St George's, University of London

Citation: Stansby, P.K. & Ma, Q. (2016). Foreword to special issue on particle methods for flow modeling in ocean engineering. *Journal of Ocean Engineering and Marine Energy*, 2(3), pp. 249-250. doi: 10.1007/s40722-016-0065-3

This is the draft version of the paper.

This version of the publication may differ from the final published version. To cite this item please consult the publisher's version.

Permanent repository link: <https://city-ref-test.eprints-hosting.org/id/eprint/18488/>

Link to published version: <https://doi.org/10.1007/s40722-016-0065-3>

Copyright and Reuse: Copyright and Moral Rights remain with the author(s) and/or copyright holders. Copies of full items can be used for personal research or study, educational, or not-for-profit purposes without prior permission or charge, unless otherwise indicated, provided that the authors, title and full bibliographic details are credited, a hyperlink and/or URL is given for the original metadata page and the content is not changed in any way. For full details of reuse please refer to [City Research Online policy](#).

Dear Author,

Here are the proofs of your article.

- You can submit your corrections **online**, via **e-mail** or by **fax**.
- For **online** submission please insert your corrections in the online correction form. Always indicate the line number to which the correction refers.
- You can also insert your corrections in the proof PDF and **email** the annotated PDF.
- For fax submission, please ensure that your corrections are clearly legible. Use a fine black pen and write the correction in the margin, not too close to the edge of the page.
- Remember to note the **journal title**, **article number**, and **your name** when sending your response via e-mail or fax.
- **Check** the metadata sheet to make sure that the header information, especially author names and the corresponding affiliations are correctly shown.
- **Check** the questions that may have arisen during copy editing and insert your answers/corrections.
- **Check** that the text is complete and that all figures, tables and their legends are included. Also check the accuracy of special characters, equations, and electronic supplementary material if applicable. If necessary refer to the *Edited manuscript*.
- The publication of inaccurate data such as dosages and units can have serious consequences. Please take particular care that all such details are correct.
- Please **do not** make changes that involve only matters of style. We have generally introduced forms that follow the journal's style. Substantial changes in content, e.g., new results, corrected values, title and authorship are not allowed without the approval of the responsible editor. In such a case, please contact the Editorial Office and return his/her consent together with the proof.
- If we do not receive your corrections **within 48 hours**, we will send you a reminder.
- Your article will be published **Online First** approximately one week after receipt of your corrected proofs. This is the **official first publication** citable with the DOI. **Further changes are, therefore, not possible.**
- The **printed version** will follow in a forthcoming issue.

Please note

After online publication, subscribers (personal/institutional) to this journal will have access to the complete article via the DOI using the URL: [http://dx.doi.org/\[DOI\]](http://dx.doi.org/[DOI]).

If you would like to know when your article has been published online, take advantage of our free alert service. For registration and further information go to: <http://www.link.springer.com>.

Due to the electronic nature of the procedure, the manuscript and the original figures will only be returned to you on special request. When you return your corrections, please inform us if you would like to have these documents returned.

Metadata of the article that will be visualized in OnlineFirst

Please note: Images will appear in color online but will be printed in black and white.

ArticleTitle	Foreword to special issue on particle methods for flow modeling in ocean engineering	
Article Sub-Title		
Article CopyRight	Springer International Publishing Switzerland (This will be the copyright line in the final PDF)	
Journal Name	Journal of Ocean Engineering and Marine Energy	
Corresponding Author	Family Name	Ma
	Particle	
	Given Name	Qingwei
	Suffix	
	Division	
	Organization	City University London
	Address	London, UK
	Email	q.ma@city.ac.uk
	ORCID	
Author	Family Name	Stansby
	Particle	
	Given Name	Peter K.
	Suffix	
	Division	
	Organization	The University of Manchester
	Address	Manchester, UK
	Email	p.k.stansby@manchester.ac.uk
	ORCID	
Schedule	Received	
	Revised	
	Accepted	
Footnote Information		

Foreword to special issue on particle methods for flow modeling in ocean engineering

Peter K. Stansby¹ · Qingwei Ma²

© Springer International Publishing Switzerland 2016



Peter K. Stansby



Qingwei Ma

Ocean engineering poses many problems with violent surface flows and structure interaction. Numerical modelling with particle methods in Lagrangian form has certain advantages over mesh-based methods in that the particles naturally follow the extreme flow distortions which may include multiphase interactions. This special issue has solicited latest developments and applications on particle methods in this context. Smoothed Particle Hydrodynamics (SPH) in its various forms is perhaps most widely applied but there are many variations such as those based on the Meshless Local Petrov–Galerkin (MLPG) method and the Moving Particle Semi-implicit (MPS) method which are also relevant.

These methods are mainly based on two mathematical formulations: one assumes that the fluid is incompressible and the other assumes that it is weakly compressible, both of which are covered in this special issue. Fundamental aspects of the incompressible formulations for the SPH and MPS methods are reviewed comprehensively in the paper by Gotoh and Khayyer with future perspectives outlined. A key component of all incompressible formulations is the solution of the Poisson's equation for pressure and approaches are reviewed in the paper by Ma et al. for ISPH, MPS and the recent MLPG_R method based on a Rankine source solution.

Incompressible SPH (ISPH) is applied to an oscillating wave surge converter with an OpenMP-based parallel computing approach by Yeylaghi et al. An implicit form of ISPH is applied to solitary wave impact on coastal structures by Sampath et al. A reduced form of ISPH is applied to extreme waves on fixed and moored structures by using Froude–Krylov forcing with analytical added mass by Lind et al., showing accurate results in many cases for little computational expense. The capability of a multi-resolution MPS method for 3D violent free surface flows is demonstrated by Tang et al.

✉ Qingwei Ma
q.ma@city.ac.uk

Peter K. Stansby
p.k.stansby@manchester.ac.uk

¹ The University of Manchester, Manchester, UK

² City University London, London, UK

The most widely used SPH is in weakly compressible form with pressure determined by an equation of state rather than a Poisson's solution. Codes running on GPUs have been applied to tsunami impact on bridge decks by Wei and Dalrymple, and to moored floating bodies by Barreiro et al. They show the versatility of this approach and compatibility with modern computing.

This special issue thus surveys fundamental aspects of particle methods for violent flow and wave–structure interaction modelling, giving latest developments and future trends.

Important applications in ocean (and coastal) engineering are provided showing that the state-of-the-art and novel approaches can already provide realistic predictions.

Peter K. Stansby
Qingwei Ma
Guest Editors

Author Query Form

**Please ensure you fill out your response to the queries raised below
and return this form along with your corrections**

Dear Author

During the process of typesetting your article, the following queries have arisen. Please check your typeset proof carefully against the queries listed below and mark the necessary changes either directly on the proof/online grid or in the 'Author's response' area provided below

Query	Details required	Author's response
1.	Please confirm if the inserted city name is correct. Amend if necessary.	Yes, the name is right.