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Main Research Interests:

System development using physical simulation

Strengths: Research utilizing the particle method^[1,2], a numerical analysis method for fluids

- [1] S. Koshizuka, Y. Oka, Moving-particle semi-implicit method for fragmentation of incompressible fluid, Nucl. Sci. Eng. 123 (3) (1996) 421-434.
 [2] 越塚誠一, 柴田和也, 室谷浩平, 粒子法入門, 丸善出版, 2014年6月25日 ISBN-13: 978-4621088340

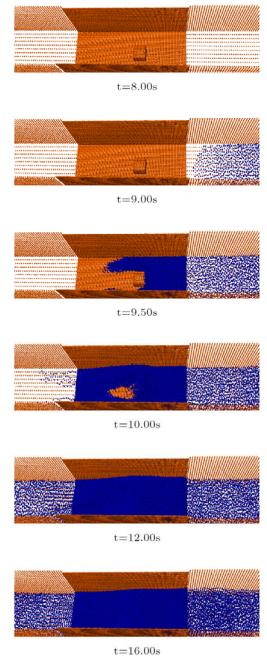


Fig.1 Tsunami simulation using a multi-resolution particle method

Particle Method Features:

The motion of liquids with large surface profile deformations and splitting and merging of fluids can be easily calculated.

Examples:

- Development of a simulator for ball bearing lubricants (joint research with JAXA)
- Development of simulator for liquid-sealed vacuum pumps (joint research with a pump manufacturer)
- Development of simulator for wave impact loads and increased resistance in waves on ships (joint research)
- Development of a simulator for tsunami, storm surge, and ocean (joint research with a marine engineering construction company)

Published Books:



(a)^[3]

(b)^[4]

Fig.6 Books

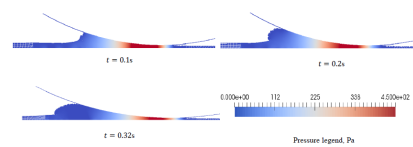


Fig.2 Ball bearing

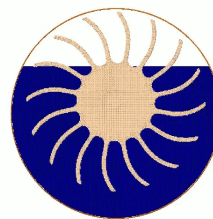


Fig.4 Pump

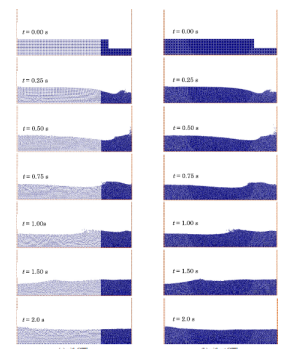


Fig.3 Tsunami simulation

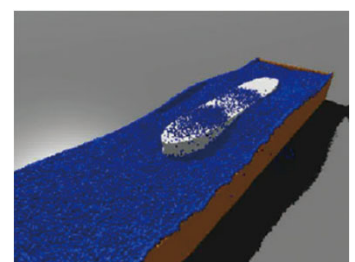


Fig.5 Ship-wave interaction simulation

[3] 越塚誠一, 柴田和也, 室谷浩平, 粒子法入門, 丸善出版, 2014年6月25日 ISBN: 978-4-621-08834-0

[4] S. Koshizuka, K. Shibata, M. Kondo and T. Matsunaga, "Moving Particle Semi-implicit Method, A Meshfree Particle Method for Fluid Dynamics", Academic Press (2018), ISBN: 9780128127797