High-order finite difference solution for 3D nonlinear wave-structure interaction

This contribution presents our recent progress on developing an efficient fully-nonlinear potential flow model for simulating 3D wave-wave and wave-structure interaction over arbitrary depths (i.e. in coastal and offshore environment). The model is based on a high-order finite difference scheme OceanWave3D presented in [1, 2]. A nonlinear decomposition of the solution into incident and scattered fields is used to increase the efficiency of the wave-structure interaction problem resolution. Application of the method to the diffraction of nonlinear waves around a fixed, bottom mounted circular cylinder are presented and compared to the fully nonlinear potential code XWAVE as well as to experiments.

General information
State: Published
Organisations: Department of Mechanical Engineering, Coastal, Maritime and Structural Engineering, Scientific Computing, Department of Informatics and Mathematical Modeling, Ecole Centrale de Nantes
Contributors: Ducrozet, G., Bingham, H. B., Engsig-Karup, A. P., Ferrant, P.
Pages: 225-230
Publication date: 2010
Peer-reviewed: Yes

Publication information
Journal: Journal of Hydrodynamics
Volume: 22
Issue number: 5
ISSN (Print): 1001-6058
Ratings:
Web of Science (2018): Indexed yes
Scopus rating (2017): CiteScore 1.86 SJR 0.254 SNIP 0.391
Web of Science (2017): Impact factor 1.563
Web of Science (2017): Indexed yes
Scopus rating (2016): CiteScore 1.47 SJR 0.255 SNIP 0.387
Web of Science (2016): Impact factor 1.174
Web of Science (2016): Indexed yes
Scopus rating (2015): CiteScore 1.24 SJR 0.234 SNIP 0.39
Web of Science (2015): Impact factor 0.776
Scopus rating (2014): CiteScore 1.09 SJR 0.327 SNIP 0.68
Web of Science (2014): Impact factor 0.659
Scopus rating (2013): CiteScore 0.91 SJR 0.261 SNIP 0.621
Web of Science (2013): Impact factor 0.582
ISI indexed (2013): ISI indexed yes
Scopus rating (2012): CiteScore 0.88 SJR 0.338 SNIP 1.002
ISI indexed (2012): ISI indexed yes
Scopus rating (2011): CiteScore 1.12 SJR 0.429 SNIP 0.938
ISI indexed (2011): ISI indexed no
Scopus rating (2010): SJR 0.411 SNIP 1.217
Web of Science (2010): Impact factor 1.475
Web of Science (2010): Indexed yes
Scopus rating (2009): SJR 0.23 SNIP 0.31
Web of Science (2009): Indexed yes
Scopus rating (2008): SJR 0.264 SNIP 0.906
Scopus rating (2007): SJR 0.206 SNIP 0.651
Scopus rating (2006): SJR 0.246 SNIP 1.182
Scopus rating (2005): SJR 0.206 SNIP 0.857
Scopus rating (2004): SJR 0.2 SNIP 0.73
Scopus rating (2003): SJR 0.198 SNIP 0.311
Scopus rating (2002): SJR 0.169 SNIP 0.123
Scopus rating (2001): SJR 0.201 SNIP 0
Scopus rating (2000): SJR 0.117