## Accepted Manuscript

Hydrodynamic Force of a Circular Cylinder close to the Water Surface
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PII:
DOI:
Reference:
S0045-7930(18)30285-8
CAF 3917

To appear in: Computers and Fluids
Received date: $\quad 5$ October 2017
Revised date: 9 April 2018
Accepted date: $\quad 30$ May 2018
Please cite this article as: Chia-Ren Chu, Yu-An Lin, Tso-Ren Wu, Chung-Yue Wang, Hydrodynamic Force of a Circular Cylinder close to the Water Surface, Computers and Fluids (2018), doi: 10.1016/j.compfluid.2018.05.032

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## Highlight

- The LES model and VOF method is used to study free surface flows over a circular cylinder.
- The effects of the gap ratio, depth ratio and Froude number on the force coefficients were analyzed.
- The pressure on the cylinder is affected by the water surface when the gap ratio less than 1.50.
- When the water depth drop behind the cylinder, the drag coefficient increases.


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