Data for *Hardware-in-the-Loop experiments in model ice for analysis of ice-induced vibrations of offshore structures**

*The data for this study are extracted from the data collected during the 2nd SHIVER test campaign in the Ice and Wave Tank of the Aalto University in 2023.
For questions about the data or test campaign, please contact Tim. C. Hammer (t.c.hammer@tudelft.nl).

1 Data

Table 1 Experiments for an ice thickness of 25 mm.

Date	Test ID	Ice Type	Substructure	Data file (.mat)
[-]	[-]	[-]	[-]	
21.06.2021*	451*	Cold*	Pile*	Test_451
03.05.2023	514	Cold	Pile	Test_514
18.04.2023	241	Cold	Pile	Test_241
06.04.2023	81	Cold	Pile	Figure 11
06.04.2023	87	Cold	Pile	Figure 11
06.04.2023	84	Cold	Pile	Figure 11
03.05.2023	534	Cold	Pile	Figure 11
03.05.2023	533	Cold	Pile	Figure 11
03.05.2023	532	Cold	Pile	Figure 11
03.05.2023	531	Cold	Pile	Figure 11
03.05.2023	529	Cold	Pile	Figure 11
03.05.2023	530	Cold	Pile	Figure 11
03.05.2023	498	Cold	Pile	Test_498
18.04.2023	242	Cold	Pile	OWT_Table1
18.04.2023	193	Cold	Pile	OWT_Table1
18.04.2023	203	Cold	Pile	OWT_Table1

*1st SHIVER test campaign (Hendrikse *et al.*, 2022)

Table 2 Data list

Channel	Unit	Explanation	Comments
[-]	[-]		
testData	[N]	Raw data	-
time	[s]	Time stamp	-
iTest	[-]	Test ID	-
sampleFrequency	[Hz]	Sample frequency	-
cutOffFrequency	[Hz]	Internally applied cut-off frequency for low-pass filter	-
disply	[mm]	Raw structure (pile) displacement	Consider offset of initial position of the substructure before postprocessing.

carvel	[mm s^{-1}]	Raw carriage velocity	It is recommended to apply a 1Hz low-pass filter to the signal.
carpos	[m]	Raw carriage position	-
carVelF	[mm s^{-1}]	Low-pass filtered carriage velocity (500 Hz)	It is recommended to apply a 1Hz low-pass filter to the signal.
relVelF	[mm s^{-1}]	Low-pass filtered relative velocity between structure (pile) and ice (carriage) (500 Hz).	It is recommended to apply a low-pass filter to the signal. The cut-off frequency should reflect the structural frequencies implemented.
velF	[mm s^{-1}]	Low-pass filtered structural velocity (500 Hz)	It is recommended to apply a low-pass filter to the signal. The cut-off frequency should reflect the structural frequencies implemented.
staticarm	[mm]	Static arms for horizontal load identification	(*l1, l2, l3, ~, ~, ~*)
Fy	[N]	Global horizontal ice load in ice drift direction	Identified via measured bending moments and static arms.
Fz	[N]	Global vertical ice load	Sum of all three load pancake cells.
Fx	[N]	Global horizontal ice load orthogonal to ice drift direction	Identified via measured bending moments and static arms.

Table 3 Experiments for an ice thickness of 25 mm.

Date	Test ID	$\bar{F}_f$	$\bar{F}_m$	Structural file
[-]	[-]	[MN]	[N]	[.csv]
21.06.2021*	451*	4	1000*	Nor_($\bar{F}_f$)*
23.06.2021*	554*	1	1000*	Hanko_($\bar{F}_f$)_LM*
03.05.2023	514	-	-	-
18.04.2023	241	7.78	963	OT2D_NREL_NB_($\bar{F}_m$)
06.04.2023	81	0.377	1086	NOR_($\bar{F}_f$)_($\bar{F}_m$)
06.04.2023	87	1.011	1086	NOR_($\bar{F}_f$)_($\bar{F}_m$)
06.04.2023	84	1.559	1086	NOR_($\bar{F}_f$)_($\bar{F}_m$)
03.05.2023	534	4	937	NOR_($\bar{F}_f$)_($\bar{F}_m$)
03.05.2023	533	6	937	NOR_($\bar{F}_f$)_($\bar{F}_m$)
03.05.2023	532	7.5	937	NOR_($\bar{F}_f$)_($\bar{F}_m$)
03.05.2023	531	10	937	NOR_($\bar{F}_f$)_($\bar{F}_m$)
03.05.2023	529	20	937	NOR_($\bar{F}_f$)_($\bar{F}_m$)
03.05.2023	530	30	937	NOR_($\bar{F}_f$)_($\bar{F}_m$)
03.05.2023	498	7.78	1104	OT2D_NREL_NB_trunc_($\bar{F}_m$)
18.04.2023	242	7.41	963	OT2D_xy_1.2m_($\bar{F}_m$)
18.04.2023	193	1.7	1179	OT2D_xy_($\bar{F}_m$)
18.04.2023	203	2.18	1020	OT2D_NREL_($\bar{F}_m$)
12.04.2023	126	50	1369	MOLI_($\bar{F}_f$)_($\bar{F}_m$)

*1st SHIVER test campaign (Hendrikse *et al.*, 2022)

2 Load identification

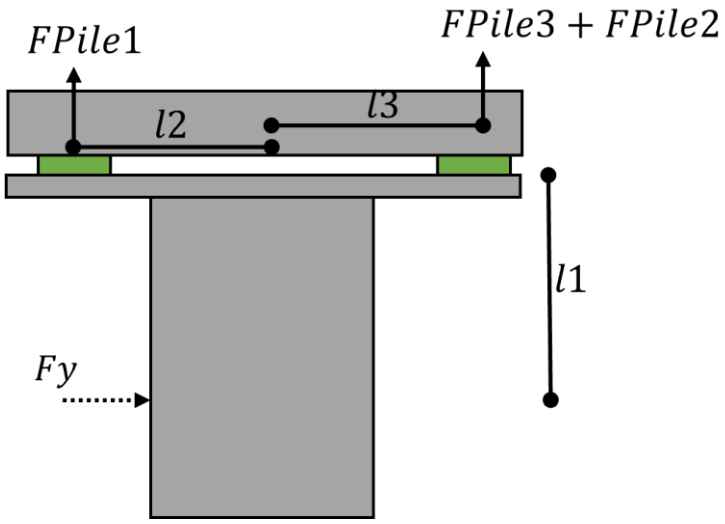

Figure 1 Forces considered during horizontal load identification.

Table 4 Static arms for ice load identification

l1	*l2*	*l3*	Substructure
[mm]	[mm]	[mm]	[-]
214	147.5	87.5	Pile
199	147.5	87.5	SLS-R
203	147.5	87.5	SLS-C

3 References

Hendrikse, H. et al. (2022) 'Experimental data from ice basin tests with vertically sided cylindrical structures', Data in Brief, 41, pp. 1–18. Available at: https://doi.org/10.1016/j.dib.2022.107877.