

# Data for Scaling ice-induced vibrations by combining replica modeling and preservation of kinematics\*

\*The data for this study are extracted from the data collected during the 2<sup>nd</sup> 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
[-]	[-]	[-]	[-]	
Rigid				
03.05	510:1:528	Cold	Pile	Rigid_data.mat
12.04	92:1:110	Cold	SLS-R	Rigid_RC_data.mat
25.04	387:1:406	Cold	SLS-C	Rigid_RC_data.mat
06.04	49:1:76	Cold	Pile	Rigid_data.mat
Aspect ratio				
25.04	379,380,382,385	Cold	SLS-C	Aspect_ratio_data.mat
18.04	189,190,192,195	Cold	Pile	Aspect_ratio_data.mat
Shape				
03.05	491	Cold	Pile	Shape_data.mat
12.04	126	Cold	SLS-R	Shape_data.mat
NSG Lighthouse				
06.04	79	Cold	Pile	NSGL_data.mat
06.04	82	Cold	Pile	NSGL_data.mat
06.04	85	Cold	Pile	NSGL_data.mat
21.06*	454*	Cold*	Pile*	*
Molikpaq				
03.05	491	Cold	Pile	MOLI_data.mat

\*1<sup>st</sup> SHIVER test campaign (Hendrikse *et al.*, 2022)

**Table 2 Data list**

Channel	Unit	Explanation	Comments
[-]	[-]		
testData	[N]	Raw data of pancake load cell <i>FPile1</i>	-
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	Offset is initial position of the substructure before testing.

carvel	[mm s <sup>-1</sup> ]	Raw carriage velocity	It is recommended to apply a 1Hz low-pass filter to the signal.
carpos	[m]	Raw carriage position	-
carVelF	[mm s <sup>-1</sup> ]	Low-pass filtered carriage velocity (500 Hz)	It is recommended to apply a 1Hz low-pass filter to the signal.
relVelF	[mm s <sup>-1</sup> ]	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 <sup>-1</sup> ]	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	( <i>l1</i> , <i>l2</i> , <i>l3</i> , ~, ~, ~)
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.

## 2 Load identification

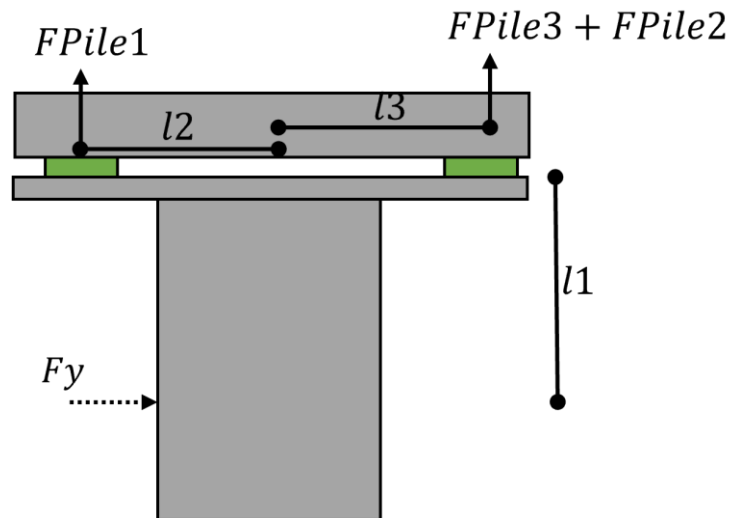


Figure 1 Forces considered during horizontal load identification.

Table 4 Static arms for ice load identification

<i>l1</i>	<i>l2</i>	<i>l3</i>	Substructure
[mm]	[mm]	[mm]	[-]
214	147.5	87.5	Pile
199	147.5	87.5	SLS-R
203	147.5	87.5	SLS-C

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### 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>.