Hydrodynamische Belastungsgrößen an Offshore Windenergieanlagen

9. FZK Kolloquium 2013

„Modellierung im Seebau und Küsteningenieurwesen“

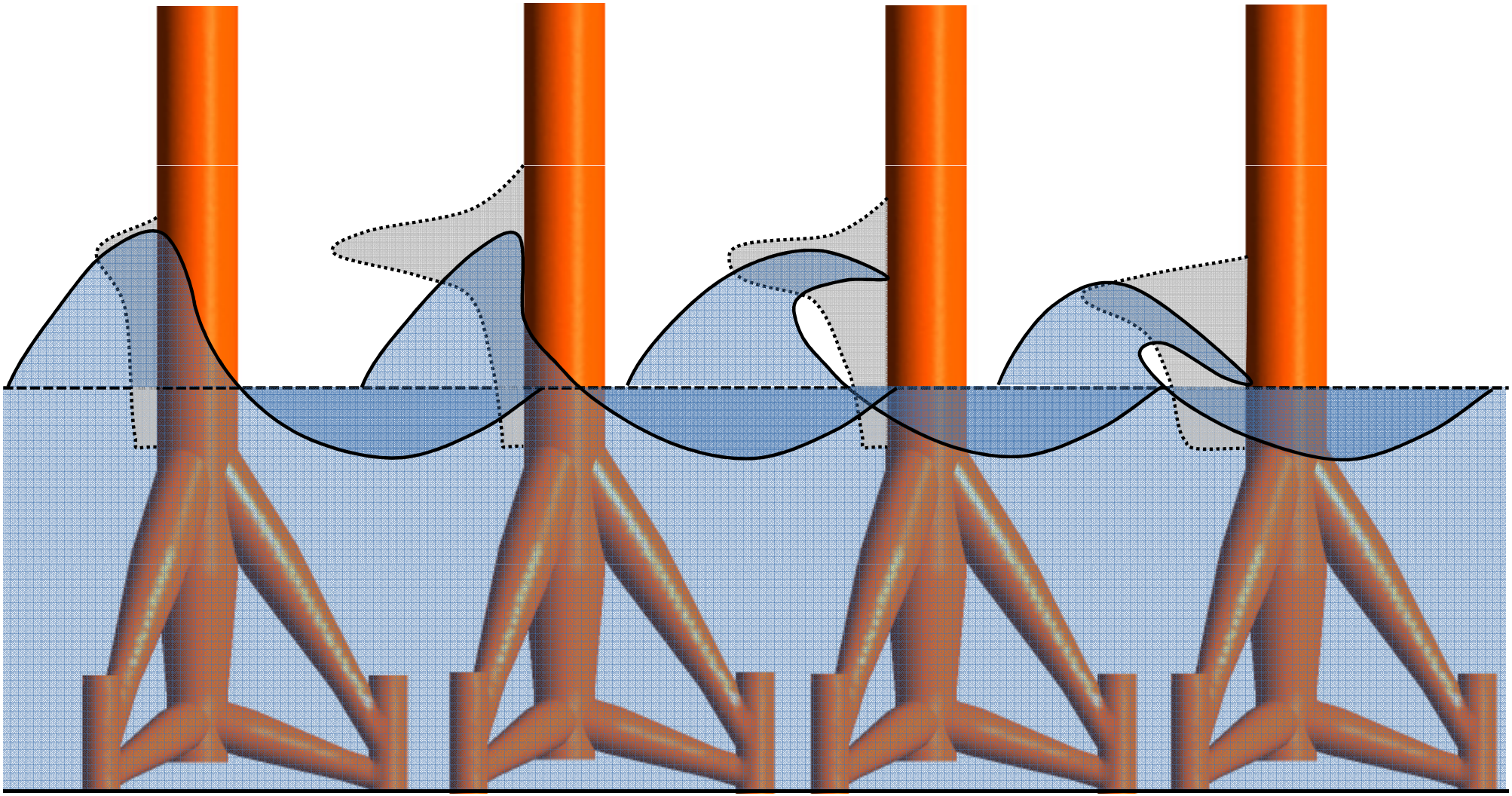
Dipl.-Ing. A. Hildebrandt, Prof. Dr.-Ing. T. Schlurmann

Franzius-Institut für Wasserbau und Küsteningenieurwesen

Leibniz Universität Hannover

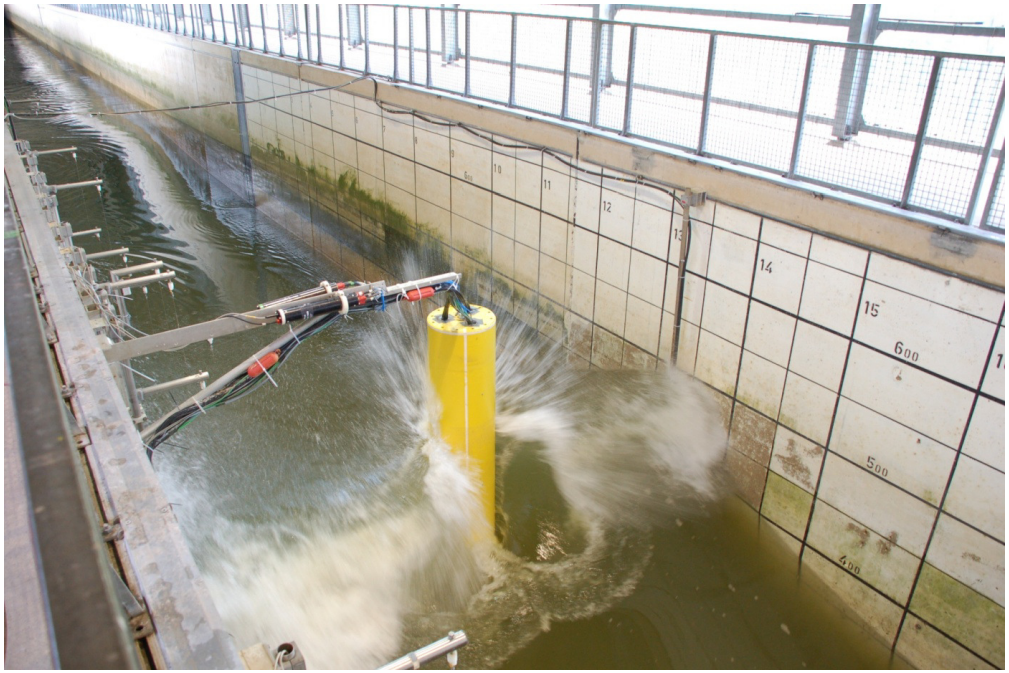
www.franzius-institut.de

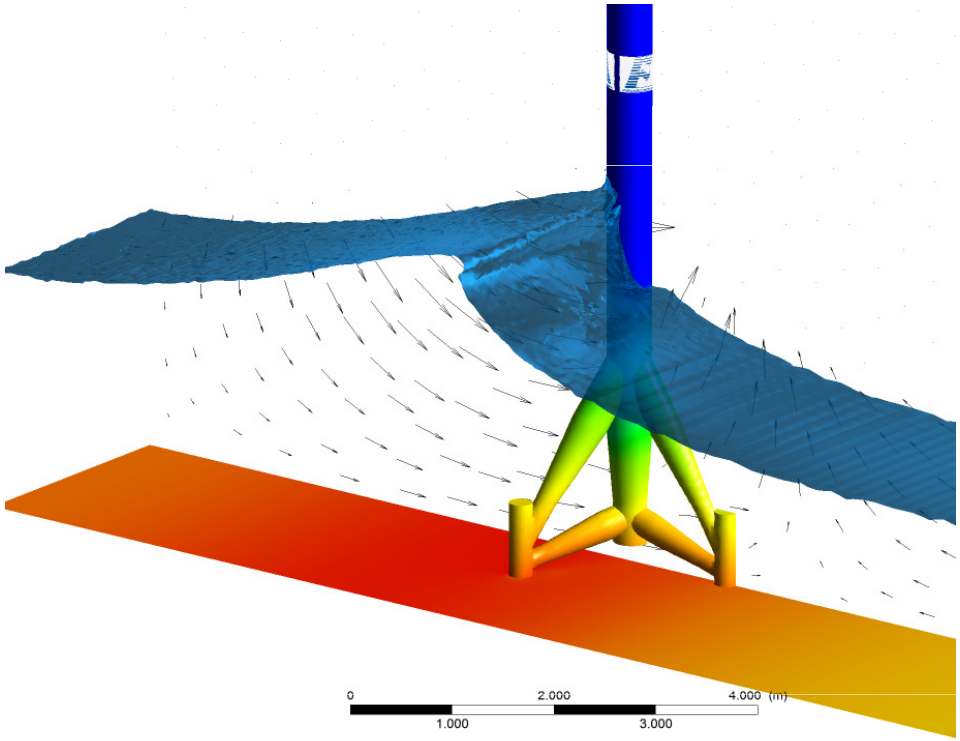
Zielsetzung, Motivation & Methode



Lastfall 1 Lastfall 2 Lastfall 3 Lastfall 4

Zielsetzung, Motivation & **Methode**

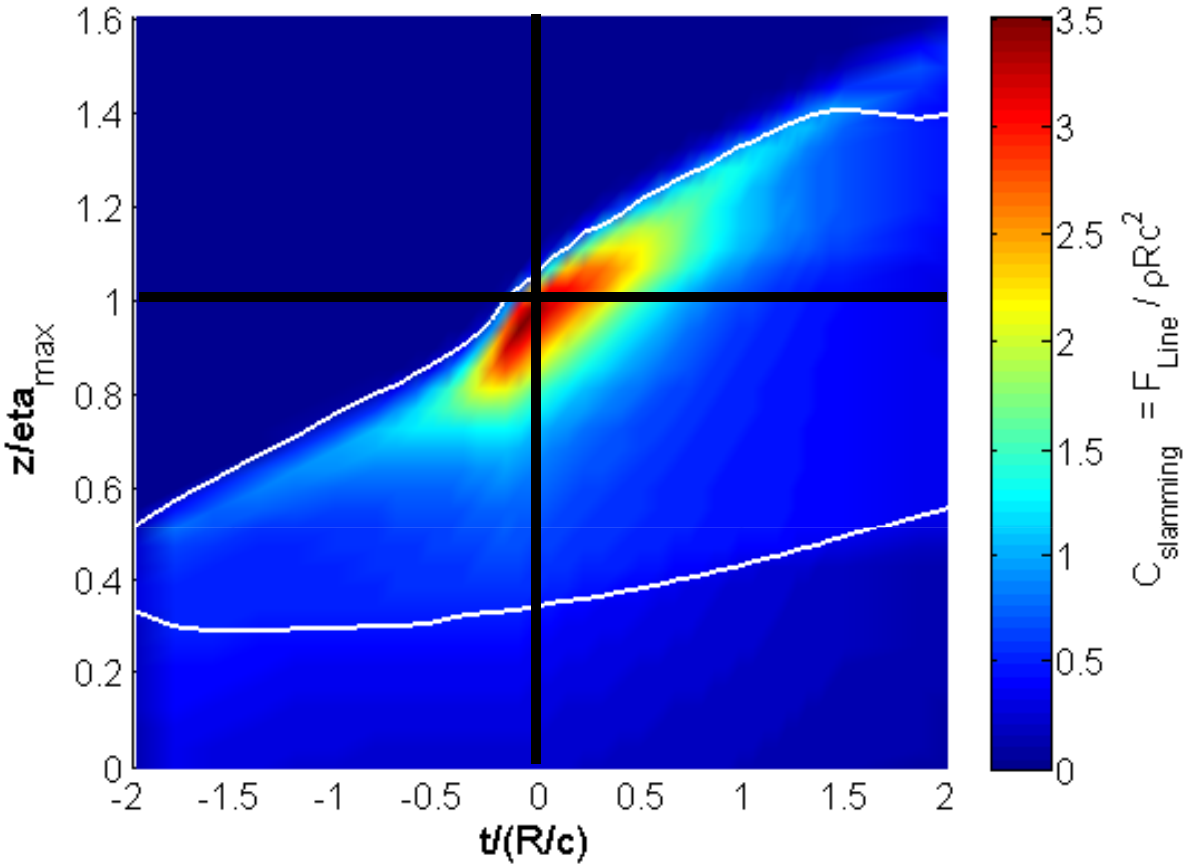


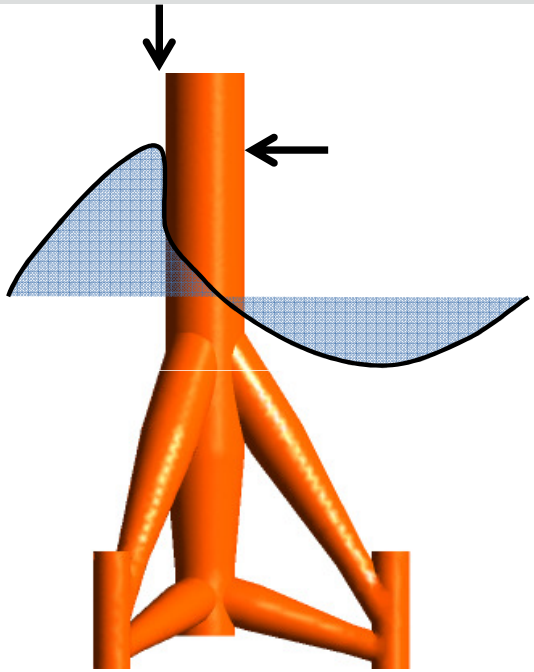


- Maßstab 1:12
- Zentralrohrdurchmesser = 0.50 m, Wassertiefe d = 2.50 m
- Wellenparameter H = 1.5 m, T = 4.16 s (Transiente Welle)

Lastfall 2 => x/D = 0

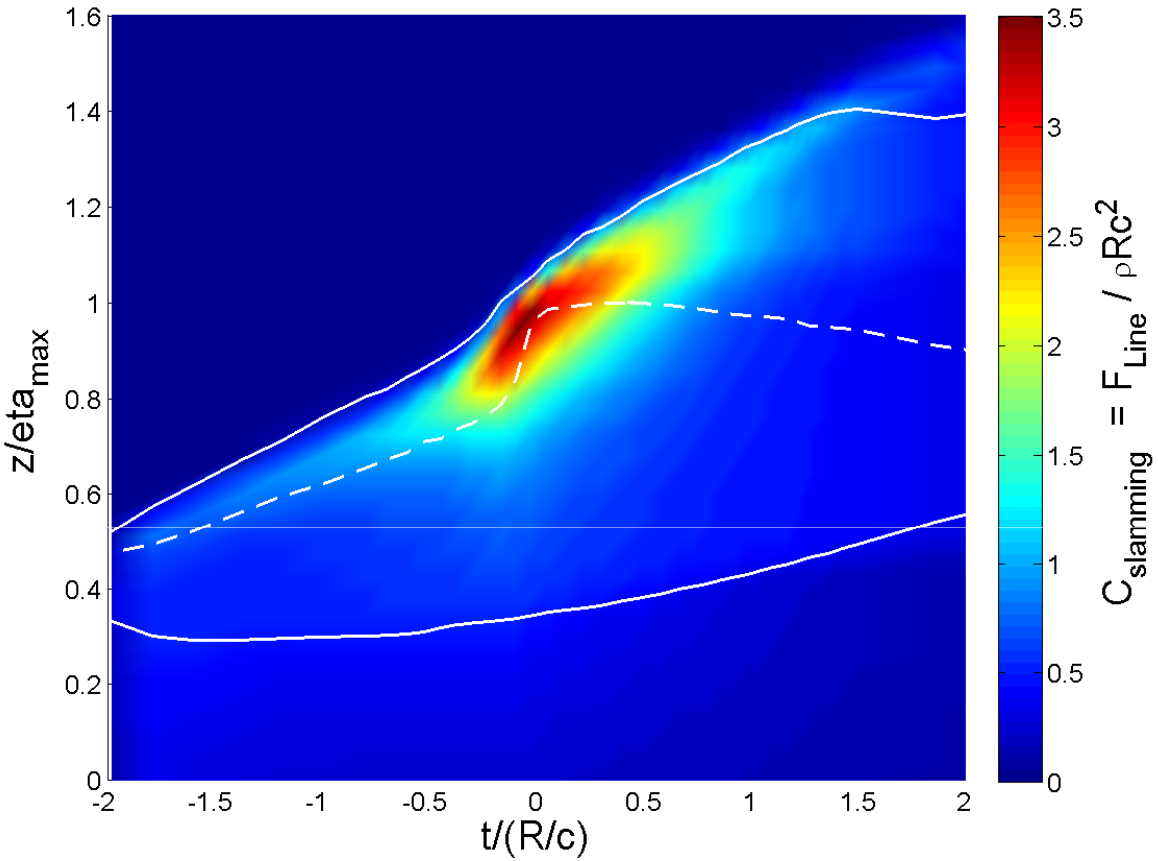
- Abschnitt mit vertikaler Front -

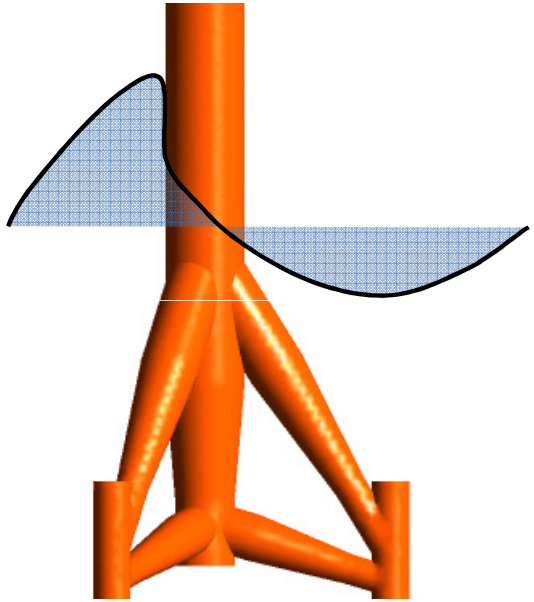




Lastfall 2 => x/D = 0

- Abschnitt mit vertikaler Front -

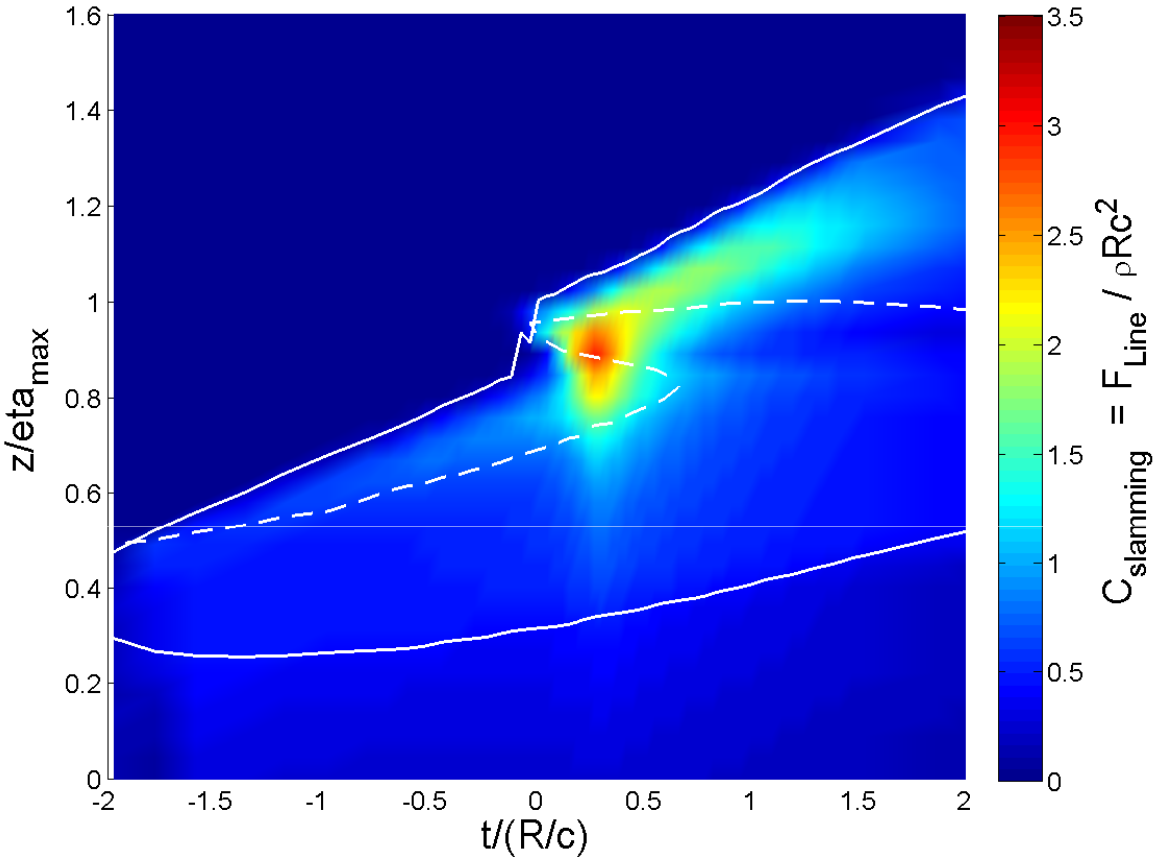


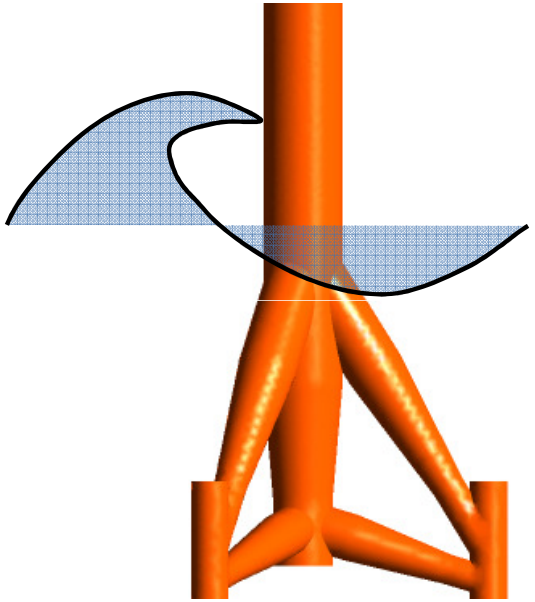


- Max-Wert Druckintensität
- Position Linienkraft
- Dauer Dynamik

Lastfall 3 => x/D = 2.2

- Vorhandene Brecherzunge -

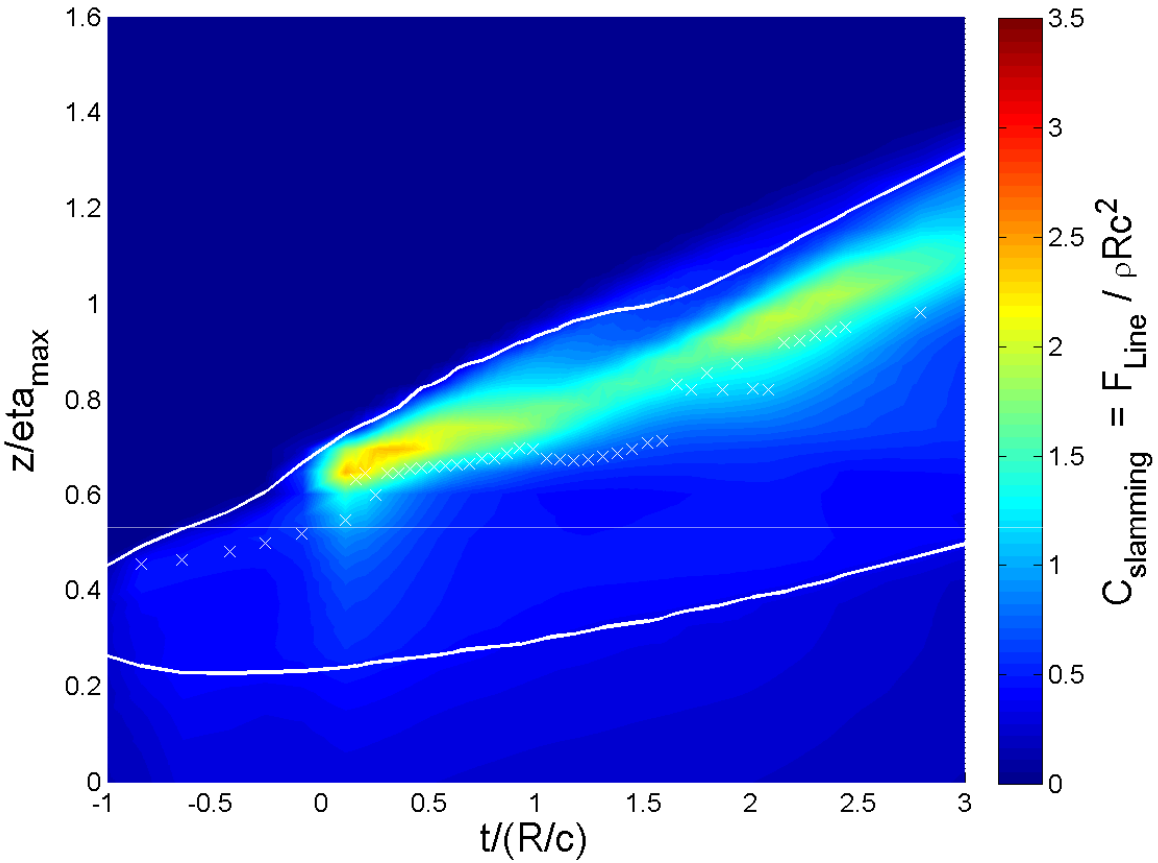


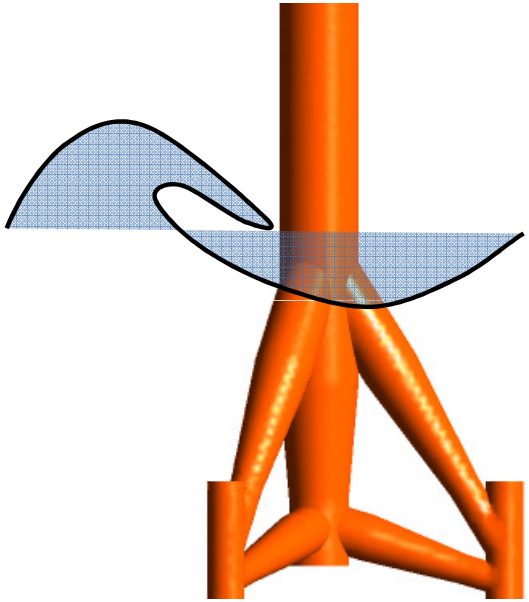


- Max-Wert Druckintensität
- Position Linienkraft
- Dauer Dynamik

Lastfall 4 => x/D = 5.4

- Gebrochene Welle -





- Max-Wert Druckintensität
- Position Linienkraft
- Dauer Dynamik

Übersicht

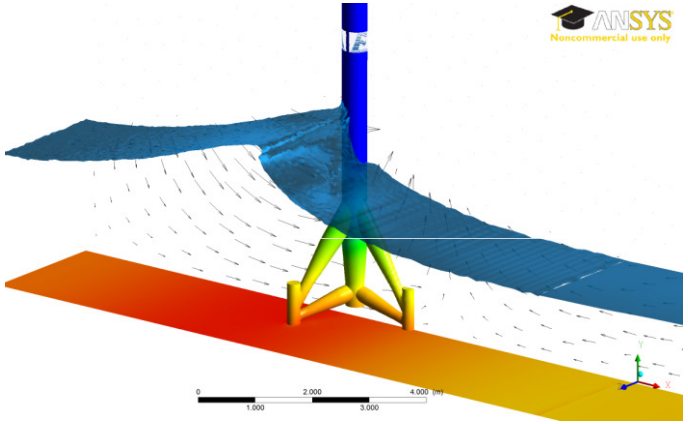
	LF 2	LF 3	LF 4
Max C_S	4	3	2.7
Curling F	0.3	0.2	0.2
Rel. Höhe	1	0.9	0.7

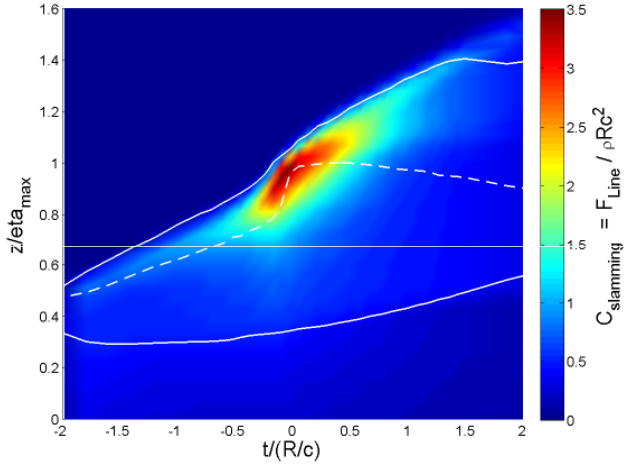
Referenzen:

Hildebrandt, A., Schlurmann, T., 2012: Breaking wave impact on offshore tripod structures - Comparison of large scale experiments, CFD simulations, and DIN recommended practice, Bautechnik, 89. Jahrgang, Heft 5, Berlin: Ernst & Sohn, (in German).

Hildebrandt, A., Schlurmann, T., 2012: Breaking wave impact on offshore tripod structures - Comparison of large scale experiments, CFD simulations, and DIN recommended practice, Bautechnik, 89. Jahrgang, Heft 5, Berlin: Ernst & Sohn, (in German).

Eingereichte Dissertation:
On Pressures, Forces, and Hydrodynamics due to Breaking Waves on Offshore Wind Turbines
– Large scale experiments and CFD simulations -





GIGAWIND

Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit

ptJ Projektträger Jülich Forschungszentrum Jülich

RAVE RESEARCH AT ALPHA VENTUS Eine Forschungsinitiative des Bundesumweltministeriums

Vielen Dank für Ihre Aufmerksamkeit!