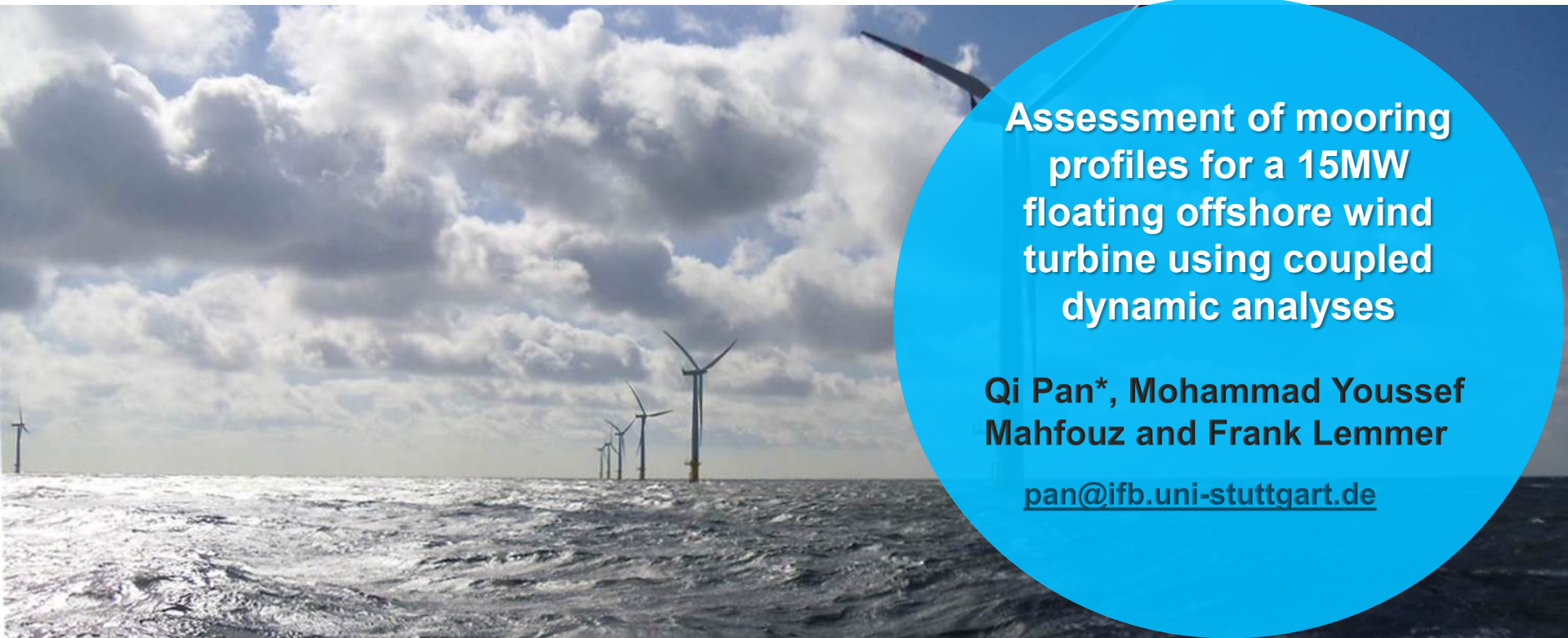


University of Stuttgart
Stuttgart Wind Energy (SWE)
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Assessment of mooring profiles for a 15MW floating offshore wind turbine using coupled dynamic analyses

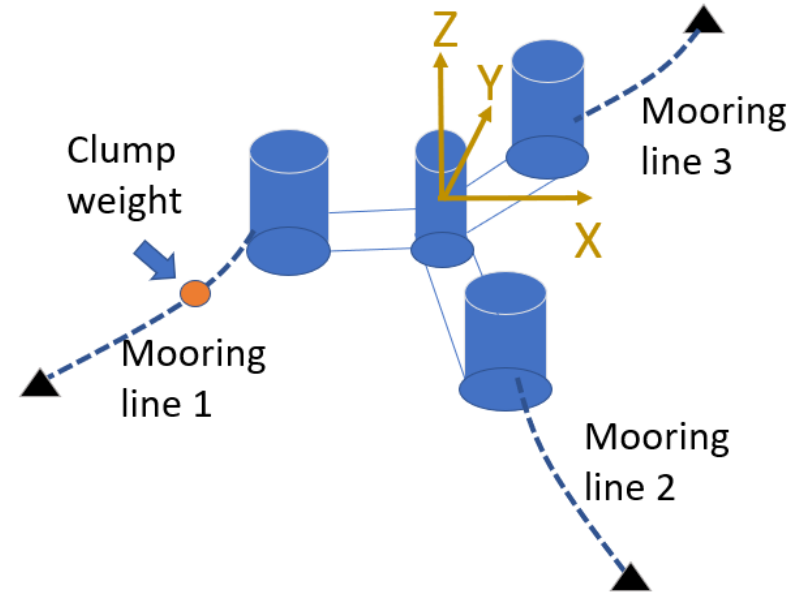
Qi Pan*, Mohammad Youssef Mahfouz and Frank Lemmer

pan@ifb.uni-stuttgart.de



Motivations, objectives and conclusions

- **Motivations**
 - . Cost-effective --- mooring cost
 - . Environment-friendly---- seabed contact
- **Objectives**
 - . Mooring profiles
 - . Coupled dynamics of a 15MW FOWT
- **Conclusions**



	Mooring footprint	Mooring length	Seabed contact	Floater surge	Line tension	Fatigue damage	Total cost
effect	↘	↘	↘	↗	↘	↗	17% ↘

Methodology

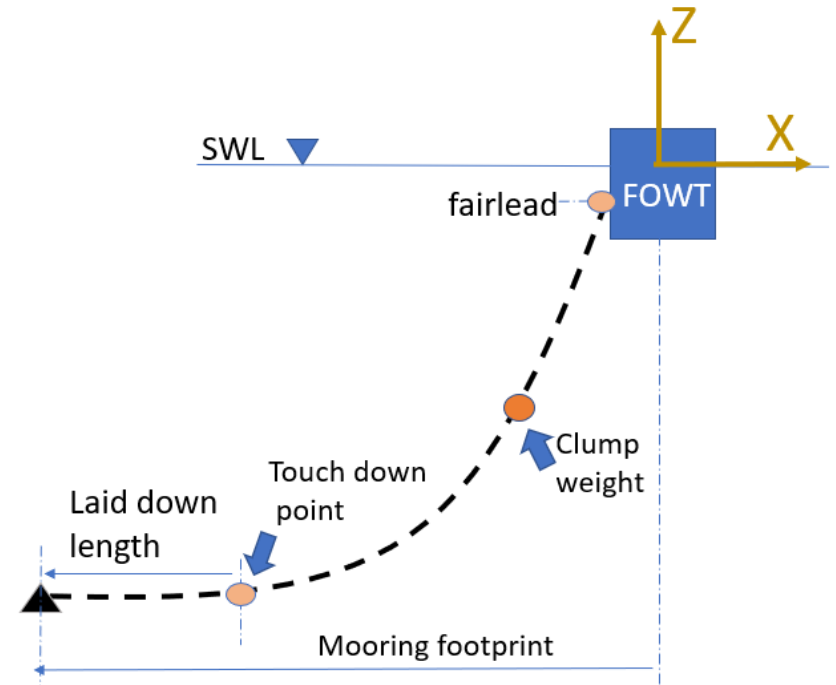
Design space

Static catenary solutions

Openfast simulation

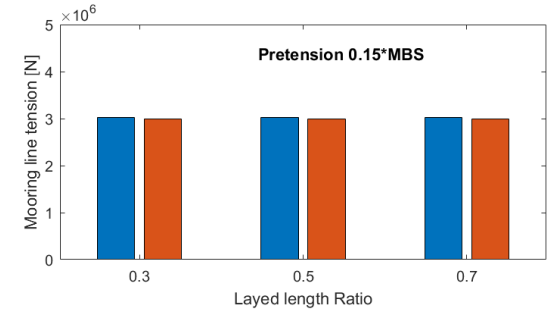
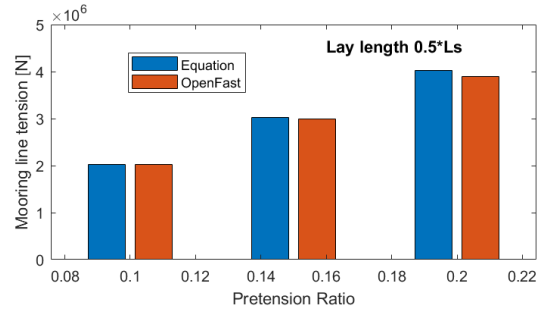
Cost function

Group	Profile number	T_{pre}	L_{lay}	W [t]	Line length [m]	Footprint [m]
1	1.1	0.10	0.50	0	591	531
1	1.2	0.15	0.50	0	750	703
1	1.3	0.20	0.50	0	881	841
2	2.1	0.15	0.30	0	650	603
2	2.2	0.15	0.50	0	750	703
2	2.3	0.15	0.70	0	850	803
3	3.1	0.15	0.30	0	650	603
3	3.2	0.15	0.34	10	650	601
3	3.3	0.15	0.39	20	650	599
3	3.4	0.15	0.51	40	650	595
4	4.1	0.15	0.30	0	650	603
4	4.2	0.15	0.30	10	628	580
4	4.3	0.15	0.30	20	606	555
4	4.4	0.15	0.30	40	559	504

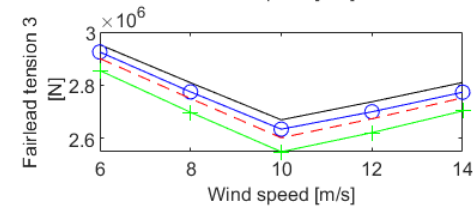
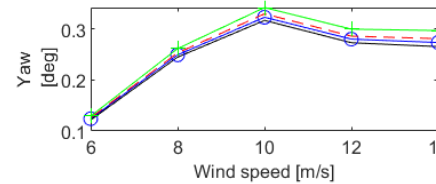
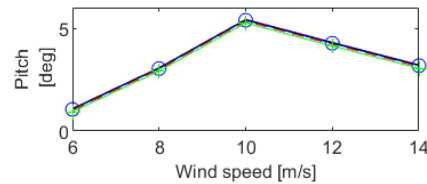
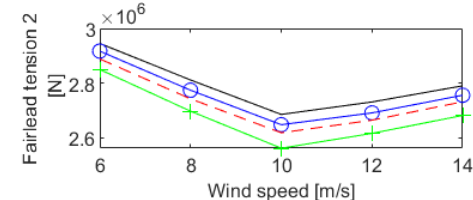
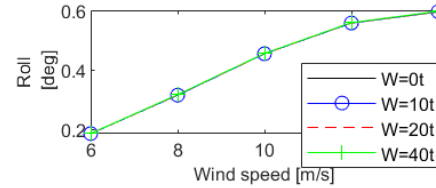
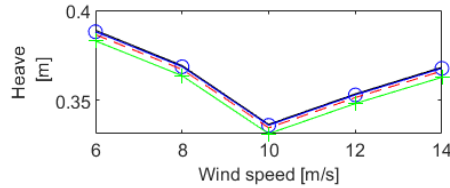
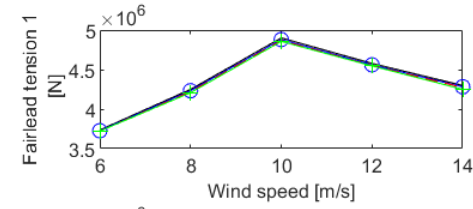
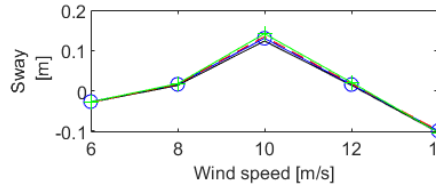
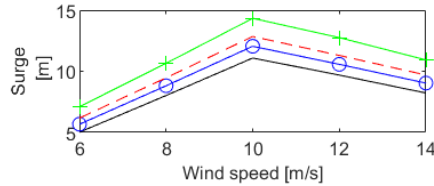


Load case results

- static equilibrium tests



- steady state tests



Load case results

- Ultimate load cases DLC6.1

