

Fabio Pierella

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Summary

I am a mechanical engineer with the passion for wind energy and fluid dynamics. I have a PhD in experimental analysis of wind turbine wake aerodynamics. Since my first PostDoc, I have worked with hydrodynamics of non-linear water waves, associated loads on structures and structural dynamics of offshore wind turbines. Experienced experimentalist, lately also productive programmer. Currently Assistant Professor of Offshore Wind Energy at DTU Wind and Energy systems.

Education

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| <i>2014</i> | Norwegian University of Science and Technology, Trondheim (NO)
Ph.D., Fluid Mechanics
Thesis: Wind Turbine Wakes and Their Interaction
Advisor(s): Lars R. Sætran |
| <i>2007</i> | Università Politecnica delle Marche, Ancona (IT)
M.Sc. Mechanical Engineering
Thesis: Wind Tunnel Test of a Vertical-Axis Wind Turbine for Urban Environment
Advisor(s): Renato Ricci |

Academic and Professional Experience

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| <i>2020 -</i> | Assistant Professor
Technical University of Denmark (DTU), Kgs. Lyngby (DK) |
| <i>2018-2020</i> | Postdoctoral fellow
Technical University of Denmark (DTU), Kgs. Lyngby (DK) |
| <i>2014-2017</i> | Postdoctoral fellow
Institute for Energy Technology (IFE), Oslo (NO) |
| <i>2015</i> | HVAC engineer
Trillini Engineering, Morro d'Alba (IT) |
| <i>2008</i> | Energy Engineer
Loccioni, Angeli di Rosora (IT) |

Teaching[†]

2022 -	46W34: Offshore Wind Energy (Online MSc) (Design of foundations for offshore wind turbines)	Teacher
2021 -	46W31: Numerical Tools for Wind Energy - HAWC2 (Online MSc) (Teaching aeroelastic simulations in HAWC2.)	Teacher
2018 -	46000: Introduction to Wind Energy (BSc) (Wind measurements, Aerodynamics, Economy of Wind Energy, Beams and structures)	Course Responsible
2018 -	46211: Offshore Wind Energy (MSc) (Structural response of a monopile to combined waves and wind forcing)	Teacher
2011 - 2012	TEP 4180: Experimental methods in Fluid Mechanics (MSc) (Temperature, pressure, flow measurements and digital acquisition via Labview.)	Teacher

[†] The Online MSc is a 60 ECTS part-time master, entirely online.

Funding Applications[†]

2022	<i>Everest - Extreme Wave Loads on Offshore Structures (under review)</i> Danish Free Research Fund (DFF) PI: Pierella, F.	0.38 M €
2022	<i>FloatLab (under review)</i> Danish Innovation Fund PI: Henrik Bredmose (DTU)	22.3 M €
2017	<i>NextFarm - Fatigue Modeling for Offshore Wind Farms (funded)</i> Norwegian Knowledge Building projects for Industries PI: Roy Stenbro (IFE)	1.2 M €

[†] Only granted and under review

Competencies

<i>Coding</i>	● Python ● Matlab ● FORTRAN ● C++ ● Julia
<i>Software</i>	● HAWC2 ● WAMIT ● OceanWave3D ● LabView ● OpenFOAM
<i>OS</i>	● Linux ● Windows
<i>Languages</i>	● Italian ● English ● Spanish ● Danish ● Norwegian
<i>Hobbies</i>	● Football ● Chess ● Cycling ● Arduino & Raspberry PI ● Ukulele ● Trumpet

Professional Activities

<i>Reviewer</i>	Coastal Engineering, Marine Structures, Wind Energy, Journal of Marine Science and Engineering (JMSE), Energies
<i>Co-organizer</i>	Session 01-07 of the OMAE conference - Wave Loading and Motions in Extreme Seas
<i>Co-Chair</i>	OMAE and EERA DeepWind conferences.

Courses and Qualifications[†]

2022	Scientific Machine Learning in Julia (PhD Course)
2022	Supervision of Large Projects at DTU
2020	Bayesian Inverse problems (PhD Course)
2020	University Teaching at DTU (UDTU)
2012	LabView Core i developer

[†] *Relevant selection*

Leave of Absence

2020	Paternity Leave (4 months 🙋Giulio)
2023	Paternity Leave (4 months, upcoming 🙋Giorgio)

Publications

Scopus 📄: 8 📄: 263 📄: 21

WoS 📄: 7 📄: 204 📄: 15

Scholar 📄: 10 📄: 439 📄: 21

In preparation

9. **Pierella, F.**, Ghadirian, A., Dixen, M., Bredmose, H. 20xx. Numerical reproduction of the De-Risk physical model tests: extreme forces from 2D and 3D waves..

In review

8. Meng, F., Lio, W.H., Pegalajar-Jurado, A.M., **Pierella, F.**, Hofschulte, E.N., Gandia Santaya, A., Bredmose, H. (2022). Experimental Study of Wind Turbine control on a Tetra-sub floater with tower velocity feedback gain., *Wind Energy Science*, <https://dx.doi.org/10.2139/ssrn.4206883>.

Published or in press

7. Ghadirian, A., **Pierella, F.**, Bredmose, H. (2022). Calculation of slamming wave loads on monopiles using fully nonlinear kinematics and a pressure impulse model, *Coastal Engineering*, <https://doi.org/10.1016/j.coastaleng.2022.104219>.
6. Kristoffersen, J. C., Bredmose, H., Georgakis, C. T., & **Pierella, F.** (2022). Numerical study of the effect of wind above irregular waves on the wave-induced load statistics., *Coastal Engineering*, <https://doi.org/10.1016/J.COASTALENG.2022.104145>.
5. **Pierella, F.**, Bredmose, H., & Dixen, M. (2021). Generation of highly nonlinear irregular waves in a wave flume experiment: Spurious harmonics and their effect on the wave spectrum, *Coastal Engineering*, <https://doi.org/10.1016/j.coastaleng.2020.103816>.
4. **Pierella, F.**, Lindberg, O., Bredmose, H., Bingham, H. B., Read, R. W., & Engsig-Karup, A. P. (2021). The DeRisk database: Extreme design waves for offshore wind turbines, *Marine Structures*, <https://doi.org/10.1016/J.MARSTRUC.2021.103046>.
3. Suja-Thauvin, L., Bachynski, E. E., **Pierella, F.**, Borg, M., Krokstad, J. R., & Bredmose, H. (2020). Critical assessment of hydrodynamic load models for a monopile structure in finite water depth, *Marine Structures*, <https://doi.org/10.1016/j.marstruc.2020.102743>.
2. **Pierella, F.**, & Sætran, L. (2017). Wind tunnel investigation on the effect of the turbine tower on wind turbines wake symmetry, *Wind Energy*, <https://doi.org/10.1002/we.2120>.
1. **Pierella, F.**, Krogstad, P. Å., & Sætran, L. (2014). Blind Test 2 calculations for two in-line model wind turbines where the downstream turbine operates at various rotational speeds, *Renewable Energy*, <https://doi.org/10.1016/j.renene.2014.03.034>.

Peer-reviewed Conference Proceedings

- Pierella, F.**, Sainz-Ávila, O., Garcia-Sanz, C., Ashraf, A., Navarro-Alonso, A., Kim, T. (2022). Numerical simulations of a 15MW wind turbine on a concrete TLP with rigid pipe tendons.
- Sørensen, J. V. T., Hansen, H. F., Mandviwalla, X., **Pierella, F.**, & Bredmose, H. (2021). Direct and fast probabilistic assessment of long term monopile load distribution from combined metocean data and fully nonlinear wave kinematics.
- Pierella, F.**, Bredmose, H., Dixen, M., & Ghadirian, A. (2021). Numerical Reproduction of the DeRisk Physical Model Tests on a Bottom-Fixed Foundation Exposed to Uni- and Multi-Directional Storm Sea States.
- Oggiano, L., **Pierella, F.**, Johansson, J., & Page, A. M. (2019). Comparison of different soil and hydrodynamic force models on a 13.2MW offshore rotor.
- Pierella, F.**, Ghadirian, A., & Bredmose, H. (2019). Extreme wave loads on monopile substructures: precomputed kinematics coupled with the pressure impulse slamming load model.
- Oggiano, L., & **Pierella, F.** (2018). CFD for Surfboards: Comparison between Three Different Designs in Static and Maneuvering Conditions.
- Pierella, F.**, Bredmose, H., de Vaal, J. B., Eliassen, L., Krokstad, J., Anders Nygaard, T., Oggiano, L., & Stenbro, R. (2018) The Dimensioning Sea Loads (DIMSELO) project.
- Oggiano, L., **Pierella, F.**, Nygaard, T. A., de Vaal, J., & Arens, E. (2017). Reproduction of steep long crested irregular waves with CFD using the VOF method.
- Pierella, F.**, Stenbro, R., Oggiano, L., Vaal, J. de, & Nygaard, T. A. (2017). Stream Function Wave Embedment into Linear Irregular Seas: A New Method Based on the Hilbert Transform.

- Oggiano, L., **Pierella, F.**, de Vaal, J., Nygaard, T. A., Stenbro, R., & Arens, E. (2017). Modeling of 2D irregular waves on a sloped bottom using a fully nonlinear Navier-Stokes/VOF formulation.
- Oggiano, L., **Pierella, F.**, Nygaard, T. A., de Vaal, J., & Arens, E. (2016). Comparison of Experiments and CFD Simulations of a Braceless Concrete Semi-submersible Platform
- Nygaard, T. A., de Vaal, J., **Pierella, F.**, Oggiano, L., & Stenbro, R. (2016). Development, Verification and Validation of 3DFloat; Aero-servo-hydro-elastic Computations of Offshore Structures.
- Oggiano, L., **Pierella, F.**, Vaal, J. de, Nygaard, T. A., Stenbro, R., & Arens, E. (2016). Comparison of experiments , CFD simulations and a finite element code on a stiff monopile in shallow water under shoaling regular waves.
- Sarlak, H., **Pierella, F.**, Mikkelsen, R., & Sørensen, J. N. (2014). Comparison of two les codes for wind turbine wake studies
- Schümann, H., **Pierella, F.**, & Sætran, L. (2013). Experimental Investigation of Wind Turbine Wakes in the Wind Tunnel
- Bartl, J., **Pierella, F.**, & Sætran, L. (2012). Wake measurements behind an array of two model wind turbines.
- Pierella, F.**, & Sætran, L. R. (2010). Effect of initial conditions on flow past grids of finite extension.