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| CONTACT INFO | National Wind Technology Center, National Renewable Energy Laboratory 18200 CO-128, Boulder, Colorado 80303, USA e-mail: georgios.deskos@nrel.gov , Personal website | |
| ACADEMIC METRICS | h-index: 9, Google Scholar Citations: 182 Google Scholar , ResearchGate | |
| AREAS OF EXPERTISE | High-fidelity modelling of offshore wind energy, Air-sea interaction, Wake modelling and control, Multiphase flows, Direct numerical and large-eddy simulation of turbulent flows, High-order methods, High-performance computing | |
| RESEARCH APPOINTMENTS | Researcher III - Computational Science | May 2021 to present |
| | National Renewable Energy Laboratory, Boulder, USA Projects: DOE A2e High Fidelity Modeling , DOE Exawind Role: Leading the offshore wind high-fidelity modelling development in the HFM and Exawind projects. | |
| | Postdoctoral researcher | October 2019 to May 2021 |
| | National Renewable Energy Laboratory, Boulder, USA Projects: DOE A2e High Fidelity Modeling Role: Developing the offshore capabilities for next-generation wind-farm simulators. | |
| | Postdoctoral Research Associate | July 2018 to August 2019 |
| | Department of Aeronautics, Imperial College London Project Title: FENGBO-WIND - Farming the ENvironment into the Grid: Big data in Offshore Wind. EPSRC Reference: EP/R007470/1 | |
| | Research Assistant | Oct 2014 to Oct 2015 |
| | Department of Civil and Environmental Engineering, Imperial College London Project Title: Towards a unified approach for the hydrodynamic modelling of Wave Energy Converters: effective linkage of non-linearity and viscous damping in potential flow models. EPSRC Reference: EP MO019977/1 | |
| EDUCATION | Imperial College London , London, UK | |
| | Ph.D., Earth Science and Engineering , February 2019 | |
| | <ul style="list-style-type: none"> • Thesis topic: <i>Numerical simulations of wind turbine wakes</i> • Supervisors: Prof. Matthew D. Piggott and Dr. Sylvain Laizet | |
| | Virginia Tech , Blacksburg, USA | |
| | M.Sc., Civil Engineering , August 2014 | |
| | <ul style="list-style-type: none"> • Research topic: <i>Incipient motion of a non-cohesive particle under Stokes flow conditions</i> • Supervisor: Prof. Panayiotis Diplas | |
| | National Technical University of Athens , Athens, Greece | |
| | BEng, Meng Civil Engineering , March 2012 | |
| | <ul style="list-style-type: none"> • Research topic: <i>Buoyant turbulent jets in confined domains: A numerical approach</i> • Supervisor: Assoc. Prof. Panos Papanicolaou | |

AWARDS

- NREL President’s Award (2021)
- Scholarship for participating in Argonne Training Program in Extreme-scale computing (ATPESC 2020)
- ARCHER Image and Video Competition for 2018, 2019
- Third place in ERCOFTAC’s Osborne Reynolds Day competition (2018)
- Energy Futures Lab, Director of Education PhD Scholarship (2015)
- Virginia Tech, Pratt Fellowship (2013)
- NTUA, Greek State Scholarships Foundation (2006)
- Eurobank award and cash prize “The Great Moment in Education” (2006)
- Bronze medal in the National Mathematical Olympiad (Archimedes) organized by the Hellenic Mathematical Society for high school students (2006)
- First place in the qualifying math competitions (Euclid) organised by the Hellenic Mathematical Society (2005, 2006)

FUNDING

- (2019) PI for accessing computational time on ARCHER through the UK Turbulence Consortium (2019), total 15,240 kAU with notional cost of £8,535
- (2019) PI, UK-China ORE Flexible Fund to conduct initial feasibility study to extend modelling capabilities of PhD-developed open-source code WInc3D to floating offshore wind farms £15,000
- (2018) PI for accessing computational time on ARCHER through the UK Turbulence Consortium (2018), total 15,120 kAU with notional cost of £8,467
- (2018) Contributor to an EU funded project (MARINET2, OFCTiTuPerf), total amount received £2,000
- (2015) PhD Scholarship from the Energy Futures Lab, Imperial College London that fully funded my doctoral studies for three years. Total amount awarded £48,456

RESEARCH PROJECT SUPERVISION

| Period | Name | Project title | Co-supervisor |
|---------|-------------------|--|---------------|
| 2019-22 | Amy Hodgkin | Wind turbine tip vortices under shear and thermal stratification (PhD) | S. Laizet |
| 2018-19 | Anastasia Fragkou | Modelling the mixing and dispersion of brine discharge from desalination plants in coastal seas (MRes) | M. D. Piggott |
| 2018-19 | Matthew Bennion | Application of Proper Orthogonal Decomposition to Wind Turbine Wakes (MEng) | S. Laizet |
| 2017-18 | Aoife Henry | Optimal control of tidal turbine wakes (UROP) | M.D. Piggott |
| 2017-18 | Sofia Walker-Saez | Condition-Based Maintenance of Offshore Wind Farms: The Use of SCADA Data in Normal Behaviour Modelling (MSc) | M.D. Piggott |
| 2016-17 | Zulkeefal Dar | uRANS-ALM Modelling of Vertical Axis Turbines (MSc) | M.D. Piggott |
| 2015-16 | Napat Tongmark | Unsteady loading of tidal turbine blades (MSc) | J. Spinneken |

TEACHING
EXPERIENCE

| Period | Module | Role | Hours |
|---------|--|-------------------|-------|
| 2018-19 | Finite Element Methods (PG) <i>IC-AERO</i> | Lecturer | 12 |
| 2017-18 | Advanced Programming (UG) <i>IC-ESE</i> | Tutorial Sessions | 21 |
| 2015-17 | Computational Methods (UG) <i>IC-CEE</i> | Tutorial Sessions | 48 |
| 2015-17 | Fluid Mechanics (Third year-UG) <i>IC-CEE</i> | Tutorial Sessions | 28 |
| 2015-17 | Fluid Mechanics (Second year-UG) <i>IC-CEE</i> | Tutorial Sessions | 14 |
| 2013-14 | Fluid Mechanics (UG) <i>VT</i> | Lecturer | 120 |

IC-AERO = Imperial College London, Aeronautics (2018-2019), *IC-ESE* = Imperial College London, Earth Science and Engineering (2017-2018), *IC-CEE* = Imperial College London, Civil and Environmental Engineering (2014-2017), *VT* = Virginia Tech (2013-2014), *UG* = Undergraduate module, *PG* = Postgraduate module

EXPERIENCE
WITH HPC

| Period | Name | Location | CPU hours used |
|---------|-------------------|-------------------------|----------------|
| 2019- | Eagle | USA (Rank 43th) | – |
| 2019 | MareNostrum | Spain (Rank 29th) | 5k |
| 2018-19 | Sunway TaihuLight | China (Rank 3rd) | 120k |
| 2018-19 | Hazel Hen (HLRS) | Germany (Rank 27th) | 1.5k |
| 2018-19 | ARCHER | UK (Tier1) (Rank 131th) | 30k |
| 2017-18 | MARCONI (CINECA) | Italy (Rank 15th) | 5k |
| 2015-19 | ICL CX2 | UK (Tier2) | 400k |
| 2016-17 | UCL Thomas | UK (Tier2) | 5k |

PROFESSIONAL
EXPERIENCE

- Private in the Hellenic Army (Corps of Signal) (May 2012-Feb 2013)
- Project management engineer for the construction of the new NATO Headquarters, HQPO NATO (Mar 2011-Sept 2011)
- Staff of the IAESTE office in NTUA, Athens, Greece
- Trainee Structural Engineer (2008-2010,2012)

AFFILIATIONS &
PROFESSIONAL
MEMBERSHIPS

- American Physical Society (APS)
- American Society of Mechanical Engineers (ASME)
- Society of Industrial and Applied Mathematics (SIAM)
- Hellenic Wind Energy Association (HWEA)
- Technical Chamber of Greece (Chartered Civil Engineer)

COMPUTER
SKILLS

- CFD Code development and contributions to: WInc3D, Nalu-Wind, amr-wind, AMReX, xcompact3d, Fluidity, OpenFoam, FLORIS
- Programming Languages: C, C++, Python, Fortran, MatLab, L^AT_EX
- Visualization tools: Paraview, TecPlot, Scientific Python
- Operating systems: Unix/Linux, Mac OS, Windows
- Main developer and contributor to collaborative software projects (nalu-wind, amr-wind, fluidity, xcompact3d) available at my [GitHub](#) repository

PAPERS
UNDER REVIEW

1. N. Bempedelis, S. Laizet, and **Deskos G.** “Turbulent entrainment in finite-length wind farms”. **Under revisions in the Journal of Fluid Mechanics.**
2. M. Kuhn, **G. Deskos**, and M. A. Sprague. “A mass-momentum consistent coupling for mesh-adaptive two-phase simulations”. **Under revisions in Computers & Fluids.**
3. **Deskos G.** “A linear forcing method to model wind-wave interactions in marine atmospheric boundary layer simulations”. **In preparation for submission to the Journal of the Atmospheric Sciences.**

1. A. Hodgkin, S. Laizet, and **G. Deskos**. “Do ambient shear and thermal stratification impact wind turbine tip-vortex breakdown?” *Journal of Physics: Conference Series* 2265.2 (2022), p. 022061. DOI: [10.1088/1742-6596/2265/2/022061](https://doi.org/10.1088/1742-6596/2265/2/022061).
2. A. Hodgkin, S. Laizet, and **G. Deskos**. “Numerical investigation of the influence of shear and thermal stratification on the wind turbine tip-vortex stability”. *Wind Energy* (2022). DOI: [10.1002/we.2728](https://doi.org/10.1002/we.2728).
3. C. Jordan, D. Dundovic, A. Fragkou, **G. Deskos**, D. S. Coles, M. D. Piggott, and A. Angeloudis. “Combining shallow-water and analytical wake models for tidal-array micro-siting”. *Journal of Ocean Engineering and Marine Energy* (2022). DOI: [10.1007/s40722-022-00225-2](https://doi.org/10.1007/s40722-022-00225-2).
4. W. J. Shaw, L. K. Berg, M. Debnath, **G. Deskos**, C. Draxl, V. P. Ghate, C. B. Hasager, R. Kotamarthi, J. D. Mirocha, P. Muradyan, W. J. Pringle, D. D. Turner, and J. M. Wilczak. “Scientific challenges to characterizing the wind resource in the marine atmospheric boundary layer”. *Wind Energy Science* 7.6 (2022), pp. 2307–2334. DOI: [10.5194/wes-7-2307-2022](https://doi.org/10.5194/wes-7-2307-2022).
5. **Deskos G.**, S. Ananthan, and M. A. Sprague. “Direct numerical simulations of turbulent flow over misaligned traveling waves”. *International Journal of Heat and Fluid Flow* 97 (2022), p. 109029. DOI: <https://doi.org/10.1016/j.ijheatfluidflow.2022.109029>.
6. R. A. Frantz, **G. Deskos**, S. Laizet, and J. H. Silvestrini. “High-fidelity simulations of gravity currents using a high-order finite-difference spectral vanishing viscosity approach”. *Computers & Fluids* 221 (2021), p. 104902. DOI: <https://doi.org/10.1016/j.compfluid.2021.104902>.
7. **Deskos G.**, J. C. Y. Lee, C. Draxl, and M. A. Sprague. “Review of wind-wave coupling models for large-eddy simulation of the marine atmospheric boundary layer”. *Journal of the Atmospheric Sciences* (2021). DOI: [10.1175/JAS-D-21-0003.1](https://doi.org/10.1175/JAS-D-21-0003.1).
8. P. Bartholomew, **G. Deskos**, R. A. Frantz, F. N. Schuch, E. Lamballais, and S. Laizet. “Xcompact3D: An open-source framework for solving turbulence problems on a Cartesian mesh”. *SoftwareX* 12 (2020), p. 100550. DOI: <https://doi.org/10.1016/j.softx.2020.100550>.
9. **Deskos, G.**, A. del Carre, and R. Palacios. “Assessment of low-altitude atmospheric turbulence models for aircraft aeroelasticity”. *Journal of Fluids and Structures* 95 (2020), p. 102981. DOI: [10.1016/j.jfluidstructs.2020.102981](https://doi.org/10.1016/j.jfluidstructs.2020.102981).
10. **Deskos G.**, S. Laizet, and R. Palacios. “WInc3D: A novel framework for turbulence-resolving simulations of wind farm wake interactions”. *Wind Energy* 23.3 (2020), pp. 779–794. DOI: [10.1002/we.2458](https://doi.org/10.1002/we.2458).
11. **Deskos, G.**, G. S. Payne, B. Gaurier, and M. Graham. “On the spectral behaviour of the turbulence-driven power fluctuations of horizontal-axis turbines”. *Journal of Fluid Mechanics* 904 (2020), A13. DOI: [10.1017/jfm.2020.681](https://doi.org/10.1017/jfm.2020.681).
12. C Wang, A Muñoz-Simon, **G Deskos**, S Laizet, R Palacios, F Campagnolo, and C. L. Bottasso. “Code-to-code-to-experiment validation of LES-ALM wind farm simulators”. *Journal of Physics: Conference Series* 1618 (2020), p. 062041. DOI: [10.1088/1742-6596/1618/6/062041](https://doi.org/10.1088/1742-6596/1618/6/062041).
13. **Deskos, G.**, S. Laizet, and M. D. Piggott. “Turbulence-resolving simulations of wind turbine wakes”. *Renewable Energy* 134 (2019), pp. 989 –1002. DOI: [10.1016/j.renene.2018.11.084](https://doi.org/10.1016/j.renene.2018.11.084).
14. **Deskos, G.** and P. Diplas. “Incipient motion of a non-cohesive particle under Stokes flow conditions”. *International Journal of Multiphase Flow* 99 (2018), pp. 151 –161. DOI: [10.1016/j.ijmultiphaseflow.2017.09.015](https://doi.org/10.1016/j.ijmultiphaseflow.2017.09.015).

15. **Deskos, G.** and M. D. Piggott. “Mesh-adaptive simulations of horizontal-axis turbine arrays using the actuator line method”. *Wind Energy* 21.12 (2018), pp. 1266–1281. DOI: [10.1002/we.2253](https://doi.org/10.1002/we.2253).

CONFERENCE
PUBLICATIONS

1. A. Hodgkin, S. Laizet, and **G. Deskos**. “Implications of shear and thermal stratification on wind turbine tip-vortex stability”. *12th International Symposium on Turbulence and Shear Flow Phenomena*. 2022.
2. A. D. Carre, G. Deskos, and R. Palacios. “Realistic Turbulence Effects in Low Altitude Dynamics of Very Flexible Aircraft”. *AIAA Scitech 2020 Forum*. 2020. DOI: [10.2514/6.2020-1187](https://doi.org/10.2514/6.2020-1187). eprint: <https://arc.aiaa.org/doi/pdf/10.2514/6.2020-1187>.
3. **Deskos, G.**, S. Laizet, and M. D. Piggott. “Development and validation of the higher-order finite-difference wind farm simulator, WInc3D”. *3rd International Conference on Renewable Energies Offshore (RENEW2018)*. Lisbon, Portugal, 2018.
4. **Deskos, G.**, M. A. Abolghasemi, and M. D. Piggott. “Wake predictions from two turbine models using mesh-optimisation techniques”. *Proceedings of the Twelfth European Wave and Tidal Energy Conference*. Ed. by A. Lewis. ISSN: 2309-1983. EWTEC. University College Cork, Ireland, 2017.
5. **Deskos, G.**, P. Dimitriadis, and P. Papanicolaou. “Density stratifications in the mixed regime of a buoyant jet in confined ambient”. *2nd Hellenic conference for hydraulics and water resources*. Patras, Greece, 2012.

CONFERENCE &
EXTENDED
ABSTRACTS

1. N. Bempedelis, **Deskos, G.**, and S. Laizet. “Turbulent entrainment in large wind plants”. *Wind Energy Science Conference*. 2021.
2. A. Hodgkin, **Deskos, G.**, S. Laizet, and N. Bempedelis. “Implications of ambient shear and thermal stratification on wind turbine near-wake dynamics”. *Wind Energy Science Conference*. 2021.
3. **Deskos, G.** and S. Ananthan. “Comparison of two interface advection schemes using a geometric volume-of-fluid (VoF) method with adaptive mesh-refinement”. *SIAM, Computational Science and Engineering (CSE21)*. (Virtual). Fort-Worth, Texas, 2021.
4. A. Fragkou, **Deskos, G.**, A. Angeloudis, and M. D. Piggott. “Modelling the mixing and dispersion of brine surface discharge from desalination plants in coastal areas”. *6th IAHR European Congress*. 2020.
5. **Deskos, G.**, G. Payne, B. Gaurier, and M. Graham. “New insights into the spectral behavior of the power fluctuations of horizontal-axis turbines”. *Bulletin of the American Physical Society*. Chicago, IL, 2020.
6. P. Bartholomew, **G. Deskos**, and S. Laizet. “Xcompact3d: a powerful framework to study turbulent flows with turbulence-resolving simulations”. *EuroHPC Summit Week*. Poznan, Poland, 2019.
7. **Deskos, G.**, S. Laizet, and R. Palacios. “Towards a non-linear aeroelastic actuator line model for scale-resolving wind farm simulations”. *Wind Energy Science Conference 2019*. Cork, Ireland, 2019.
8. **Deskos, G.** and S. Laizet. “Energy-consistent estimations of entrainment for fully-developed wind farms”. *Bulletin of the American Physical Society*. Atlanta, GA, 2018.
9. **Deskos, G.**, S. Laizet, M. D. Piggott, and R. Palacios. “WInc3D: An integrated framework for multi-physics wind farm simulations”. *UK Turbulence Consortium Annual Review*. London, UK, 2018.
10. **Deskos, G.**, S. Laizet, M. Piggott, and S. Sherwin. “Large eddy simulation of turbine wakes using higher-order methods”. *Bulletin of the American Physical Society*. Denver, CO, 2017.

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| | <ol style="list-style-type: none"> 11. Deskos, G., J. Spinneken, and M. Piggott. “Impact of the free surface proximity on the performance of a single Tidal Stream Turbine: A Vortex Filament Approach”. <i>5th Oxford Tidal Energy Workshop</i>. 2016. 12. D. Bouziotas, Deskos, G., N. Mastrantonas, D. Tsaknias, G. Vangelidis, S. M. Papalexiou, and D. Koutsoyiannis. “Long-term properties of annual maximum daily river discharge worldwide”. <i>European Geosciences Union (EGU) General Assembly</i>. 2011. |
| MISCELLANEOUS PUBLICATIONS | <ol style="list-style-type: none"> 1. Deskos, G. <i>Numerical Simulations of wind turbine wakes</i>. PhD thesis. London, UK, 2019. 2. Deskos, G. <i>Incipient motion of a non-cohesive particle under Stokes flow conditions</i>. MSc Thesis. Blacksburg, USA, 2014. 3. Deskos, G. <i>Buoyant turbulent jets in confined domains: A numerical approach</i>. (Greek). Diploma Thesis (MEng). Athens, Greece, 2012. |
| ORGANIZING/ COMMITTEE ROLES | <ul style="list-style-type: none"> • Organizing and Leading a DOE-sponsored Workshop on “Air-Sea Interaction and Implications for Offshore Wind Energy” • Co-organizer of a mini-symposium in SIAM 2021 Conference on Computational Science and Engineering (CSE21) titled “Adaptive Mesh Refinement in multiphase flow modeling and engineering applications” |
| REVIEWER | Journal of Fluid Mechanics (Cambridge), Journal of the Atmospheric Sciences (AMS), Renewable Energy (Elsevier), Applied Energy (Elsevier), Journal of renewable and sustainable energy (AIP), Atmosphere (MDPI), Environmental Processes (Springer), Ocean Engineering (Elsevier), Energies (MDPI), Wind Energy (Wiley), The Journal of Solar Energy Engineering - Including Wind Energy and Building Energy Conservation (ASME) |
| INVITED TALKS | <ol style="list-style-type: none"> 1. Plenary Talk of Air-sea interactions and implications for Offshore Wind Energy, NAWEA/WindTech (22/09/2022) 2. DOE’s Wind Energy Technologies Office (WETO) (11/12/2020) 3. UK-China Joint ORE Conference, Qingdao, China (08/07/2019) 4. Energy Futures Lab, Imperial College London, London (1/11/2018) 5. Offshore Renewable Energy Summer School, London (12/07/2018) 6. University of Colorado, Boulder, USA (10/11/2017) 7. Delft University, Delft, The Netherlands (15/3/2017) 8. Dalian University, Dalian, China (26/1/2015) |