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EMERGING TECHNOLOGIES IN GEOTECHNICAL AND GEOPHYSICAL SITE CHARACTERIZATION FOR OFFSHORE WIND TURBINE FOUNDATIONS

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ABSTRACT

Offshore wind energy is growing rapidly in recent years due to the increasingly urgent need for governments to meet ambitious renewable energy targets with a view to reducing reliance on fossil-based fuels. With the race to mitigate global average temperatures exceeding +1.5 °C relative to pre-industrial levels, this requires immediate effort from societies worldwide. This has led to significant advances in wind turbine technology, arguably the most scientifically-mature renewable energy source, which are growing larger to produce more energy. Current turbines have increased energy production capabilities from 2-3 MW in the mid-2000s to over 16 MW today. This has been coupled with a growth in the physical size of these machines, necessitating significant advances in the technology surrounding the structural and geotechnical engineering aspects. This mini-symposium aims to discuss the latest advances in foundation technology and soil mechanics related to the behaviour and design of emerging large-capacity wind turbines. Contributions are welcome in topics related (but not limited) to: emerging foundations, novel technologies, soil behaviour, cyclic loading, pore pressure dissipation, novel modelling approaches, health monitoring, site characterisation for design, damping estimation, fatigue, and decommissioning.