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Viegas, Isabelle Moraes Amorim

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An innovative approach for monitoring oil in water using advanced fluorescence spectroscopy

Isabelle Moraes Amorim Viegas, Postdoc, DTU Offshore

Produced water (PW) is composed primarily of crude oil, which can be found both dispersed and dissolved in the water phase. The dissolved oil-derived components are more difficult to clean from PW as they cannot be removed by physical processes and are also undoubtedly the most toxic ones, which gives rise to the urge to efficiently monitor the oil concentration in PW throughout the cleaning process, especially at the discharge point. We propose the use of fluorescence spectroscopy as a technique for sensing the oil concentration in water as it presents some advantages over well-established techniques, such as quick or even instant scans, high sensitivity, low operational and maintenance cost, and not requiring any solvents or sample preparation procedure. In this talk, we will share the most recent results obtained with our in-house designed prototype of a fluorescence-based oil-in-water analyzer, comprising in-lab tests and validation and application in a flow-loop setup. Although our first target sample was PW, the principles and set-up of the proposed sensor extend to any application with crude oil in water.



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