



Recent advances in monitoring methods for gas release sites and for application in the context of methane hydrate production

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Subsea gas production is an important resource as a primary energy carrier all over the world. Today natural gas is mainly produced from wells that penetrate deep into earth's crust to be able to exploit this resource. However, recently significant resources have been devoted in finding ways to exploit much shallower reservoirs that seemingly hold vast amounts of natural gas in the form of methane hydrate. Methane hydrates can be found all over the world at the continental slopes, where pressure is sufficiently high and temperature is low enough to form methane hydrates.

Many parties and nations investigate methods and technologies to exploit these resources. While developing and testing exploitation methods of such methane hydrate reservoirs, existing subsea environmental monitoring systems for gas release sites have to be updated and adapted to the new scenarios.

While underwater gas sensors for i.e. CH₄ can be considered standard equipment within environmental monitoring systems and seabed deformation tracking is successfully used to check for subsidence or uplift on lander platforms, the equipment used nowadays improves continuously in terms of stability, accuracy and sensitivity. New methods include the automated detection and quantification of gas bubbles in the water column during long-term lander deployments, an option that was scientifically evaluated in the past, but now becomes industrially applicable on stationary seabed platforms.

In the presentation, we will give an overview over state-of-the-art measuring technologies used on stationary platforms that can be placed next to gas release sites or near to seabed operations. We will describe the modus operandi for these systems and discuss example data and present derived information obtained from test deployments conducted at gas release sites in methane hydrate fields of the Black Sea.