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## **A new in-situ methane sensor for the study of hydrothermal plumes based on Surface Plasmon Resonance (SPR)**

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Hydrothermal activity along mid-ocean ridges is a major source of methane to the deep ocean. Information on the concentration and distribution of dissolved methane in real time is of great value in detecting, monitoring and understanding the functioning of hydrothermal plumes. We have laboratory tested a new technique for the measurement of dissolved methane concentration, consisting of Surface Plasmon Resonance (SPR) sensors associated with a specific chemically reactive layer whose refractive index is modified in presence of methane. Several configurations of the sensor were repeatedly tested, using a dissolved gas calibration system. The effects of temperature and salinity were characterized to assess their influence on the sensor measurements. The laboratory-based results showed that the technique is specific, sensitive, and reversible and are thus, the first steps towards a new in-situ methane sensor for deep-sea studies.