**FLYING FATS INSTRUMENTAL ODOUR MONITORING SYSTEM**

**ALONSO-VALDESUEIRO, Javier**1, GUTIERREZ, Agustin1, MARCO, Santiago1,2

1 University of Barcelona, Spain

2 Institute for Bioengineering of Catalonia (IBEC), Spain

javier.alonsov@ub.edu

**Introduction:** Instrumental Odour Monitoring Systems (IOMS) have recently been integrated into drones for 3D odour mapping of industrial sites (1)(2). However, their performance, particularly in terms of system response time, is still improving, which limits their ability to accurately quantify odours in real time or classify sources. In this work, a novel IOMS design is presented and tested. Its modularity and optimized fluidic path reduce the time required for gas concentrations to reach the Limit of Detection (ΔLoD) of each sensor within the IOMS. The performance of this design is compared with a previous IOMS model(2), both in laboratory conditions and at a Waste Water Treatment Plant (WWTP).

**Materials & Methods:** In the new IOMS, the airflow is directed into four separate chambers, each containing different types of chemical sensors, including four TGS series sensors and H₂S sensors. In the laboratory experiments, 25 mL of ethanol was placed inside a box for 2 minutes, and both IOMS systems, the old(2) and the new, recorded data for baseline correction, exposure, and recovery. The output of both IOMS units was passed through an Aurora Scientific miniPID 201B. At the Waste Water Treatment Plant (WWTP) in Torredembarra, Catalonia (Spain), both systems measured gas concentrations from an H₂S source. A 2-meter tube was placed at the entrance of each IOMS, and after an initial period of recording, the tubes were positioned closer to the source.

Gráfico, Histograma

Descripción generada automáticamente **Results:** As shown in Fig. 1 (a), the response of the TGS sensors in both IOMS designs is compared with the response of the miniPID 201B. It is observed that the new design begins to detect the gas entering its chambers significantly faster than the previous design (~15 seconds faster). A similar result (~14 seconds) was observed at the WWTP when both the old and new IOMS designs were exposed to an H₂S source under the same conditions.

**Fig.1** (a) Characterization of the ΔLoD of the new IOMS design compared with an old IOMS design. The miniPID signal allows the time characterization. (b) Response of the H2S sensors in the new and old IOMS when exposed simultaneously to a H2S source at a WWTP.

**Conclusion:** This contribution presents a new modular design of IOMS, developed for drone integration and specifically designed to reduce the ΔLoD compared to previous designs. This improvement makes the new IOMS more suitable for rapid 3D odour mapping of industrial plants than earlier models.

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