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P088 PRELIMINARY ASSESSMENT OF MINIRAMAN ASSISTED BY CHEMOMETRICS TO DETECT EMERGING CONTAMINANT IN WASTEATER

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ABSTRACT

The possible use of reclaimed water for irrigation represents a great opportunity for water conservation and fits in the circular economy approach. Urban and industrial wastewater needs several treatments to eliminate contamination from different sources. Still, several pollutants may be persistent after treatment, and up to now, emerging contaminants (ECs), such as pharmaceuticals and personal care products, are not regulated, despite the growing interest of the scientific community. This study, which is part of a larger project, i.e., EXWASTER (see below), is focused on exploiting the potential use of portable Raman (lightnovo miniraman) as an untargeted, fast, and implementable in-situ approach to detect ECs in wastewater. In the complete project, both spot and passive sampling by Polar Organic Chemical Integrative Samplers (POCIS) strategies will be employed. The spectra will be acquired directly on the POCIS sorbent phases as well as on solid phase extraction cartridges (used to preconcentrate the sample) by evaluating different types of sorbent phases. The preliminary study presented here will deal with optimization of sample presentation, spectra acquisition, pretreatment (finding the best chemometrics tools and pipeline for denoising, baseline correction, and normalization), information retrieval, and multivariate calibration (evaluating PLS regression as well as spectral unmixing and calibration by MCR-ALS) by using a multi-standard mixture of ECs. The optimized procedure will be tested on a few samples coming from a wastewater treatment plant, both before and after treatment.

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