WaterSpy – two years of research

The WaterSpy project is developing water quality analysis photonics technology suitable for online, field measurements. WaterSpy technology will be integrated, for validation purposes, into an existing, commercial water quality monitoring platform, in the form of a portable add-on. WaterSpy will be used in the field for the analysis of critical points of water distribution networks. This will be demonstrated in two different demo sites in Italy.

The project has just completed the first **two years of research**. Important results have been delivered, while significant technical tasks are currently ongoing, with the aim of starting field validation of the device in six months from now. Important results obtained include:

1. Different versions of packaged Quantum Cascade Lasers (QCL), developed for the WaterSpy experiments and preliminary device prototype. The necessary drivers were also delivered. These are the sources for our optical detection module. A beam combiner has also been prepared.
2. Different versions of the photodetectors to be used in the WaterSpy concept. A novel balanced detection amplifier was also designed and developed. With the balanced detection amplifier, two photodetectors per device are needed. These photodetectors need to be as identical as possible and this requires a lot of effort and experimentation.
3. Antibodies against the targeted bacteria were produced and will be used in the biosensing surface of the WaterSpy device.
4. Two different approaches for the WaterSpy ATR and microfluidics configuration have been designed in detail and experiments are taking place for selecting the final one that will be used in the field-validation version of the WaterSpy device.
5. All hardware modules of the WaterSpy device have been prepared in two different versions (preliminary and updated one). Such modules include the main processing unit, the automated incubator, the fluidics handling module, the microfluidics module and the device firmware module.
6. A novel polarimetric setup for ATR spectroscopy measurements was developed and is currently being tested. Investigation includes various issues for optimizing its performance.
7. Several dissemination activities. Progress and results have been presented in conferences and trade fairs, while newsletters and flyers are regularly produced and distributed. A second press release was issued about six months ago, leading to the project receiving significant attention from the media and related companies.
8. A mid-project system integration was successfully completed. The testing verified the functionality of all modules and provided the “green light” for the forthcoming full system laboratory testing and validation.

The second project review by the EC also took place in September 2018, with a positive outcome. During the next six months, the project efforts will be concentrated on the integration of the second prototype to be used for full laboratory testing and preliminary field validation in May 2019.

The WaterSpy project is funded by Horizon 2020, the EU Framework Programme for Research and Innovation for 2014-2020 and is an initiative of the Photonics Public Private Partnership (www.photonics21.org). The WaterSpy project consortium includes 9 partners from 7 different European countries, coordinated by CyRIC, Cyprus Research and Innovation Center Ltd. The project was launched in November 2016.

More information about the project and the partners can be found on our website: www.WaterSpy.eu.