

The LOTUS sensor decrypted by Bérengère Lebental !



Dr. Bérengère Lebental is a physicist specialized in sensors based on nanotechnologies for application in sustainable development, but also environmental monitoring, and engineering monitoring. She is working at the University Gustave Eiffel located in east of Paris at Cité Descartes.

Dr Bérengère Lebental is developing the LOTUS sensor used in the project and implemented in different use cases. Here is some information about what it is and how it works.

The LOTUS sensor is a multiparameter chemical sensor array based on carbon nanotubes technology. It can monitor multiple chemicals at the same time and on the same chip. As water composition is a very complex matrix composed of numerous ions, the challenge here is to have a sensor selective to specific chemicals. To achieve this selection, the idea is to wrap the nanotube

in molecules and those molecules are designed to react specifically to the target chemicals in the water. Those information on chemicals will be collected on one only chip, that is going to read all the data, then sent the information to an antenna and finally share it through the Cloud.

Within the framework of LOTUS, the sensor is targeting four main parameters at this point which are:

- PH,
- active chlorine,
- temperature and
- electric conductivity of the water.

However, other parameters can be added.

Today, the parameters that the LOTUS chip is measuring are available with other sensors, but those sensors will be separate devices (one for the

measurement of each parameter), the results will be bulkier, and it would be more expensive.

The main advantage of a LOTUS sensor is that it can provide a very compact solution at lower cost than the market for separate sensors. In addition, the sensor

can be used for other parameters that, as of now, cannot be measured. The LOTUS sensor can also be replicated, with the right modifications and R&D, and applied to other countries which will need other parameters to be monitored, or that will need other usage, like air quality monitoring.

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