

# UV-LED and Laser Fluorescence for Monitoring Water Quality

**R**esearchers at the University of South Florida have developed an innovative method of detecting contaminants and potentially harmful substances in drinking water.

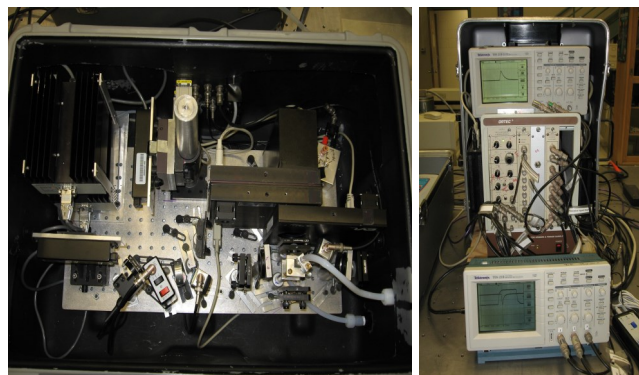
Most approaches for monitoring water quality utilize wet chemistry, gas and liquid chromatography techniques. These require the use of chemicals, and although useful in a lab setting, they work less in the field where chemicals are difficult to replace and harsh conditions may degrade them. More efficient advances involve the use of laser induced fluorescence methods. Those currently on the market require special sample preparation and additional reagents, which renders it difficult to conduct experiments in real-time or online. In addition, more advanced systems are not very cost efficient. The development of a low cost, reagent-less, compact laser induced fluorescent (LIF) system would eliminate the drawbacks with previous models.

Our inventors have developed a deep ultra-violet light emitting diode LIF system for detecting trace levels of dissolved organic contaminants in water. The deep-UV LED component sets this technology apart because of its low power consumption, which is approximately one thirteenth of the average laser power. This results in a more compact, cheaper, and transportable system. The technology has been tested on a wide range of water sources, from bottled water to rivers and its efficiency has been highly consistent. This novel approach has a sensitivity of a few parts per trillion, which is several orders of magnitude better than conventional models. The system does not require the use of reagents or chemicals and the results produced are superior to similar systems currently on the market.

## ADVANTAGES:

- Detect trace levels of dissolved organics and plastics in water
- System is very cost-efficient
- Does not require the use of reagents or chemicals
- Data obtained in real-time on the field site
- Deep UV-LED consumes much less power and is more compact and transportable

*UV light emitting diode LIF system for detecting trace levels*



*Figure 1: Portable LIF system*

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