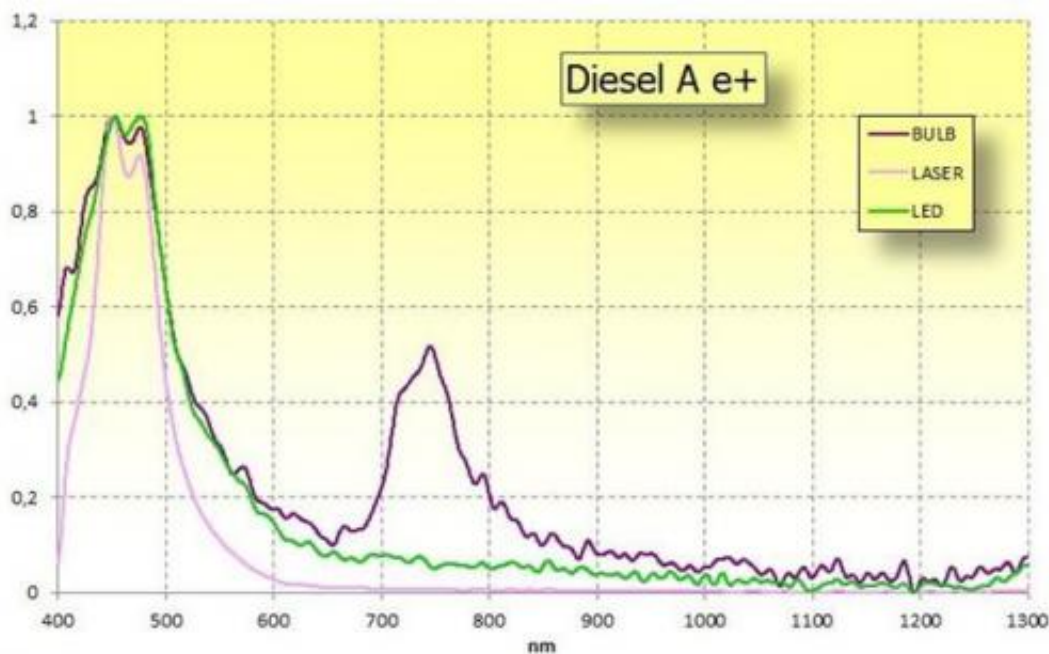


# Progress in the automatic detection of water contaminants

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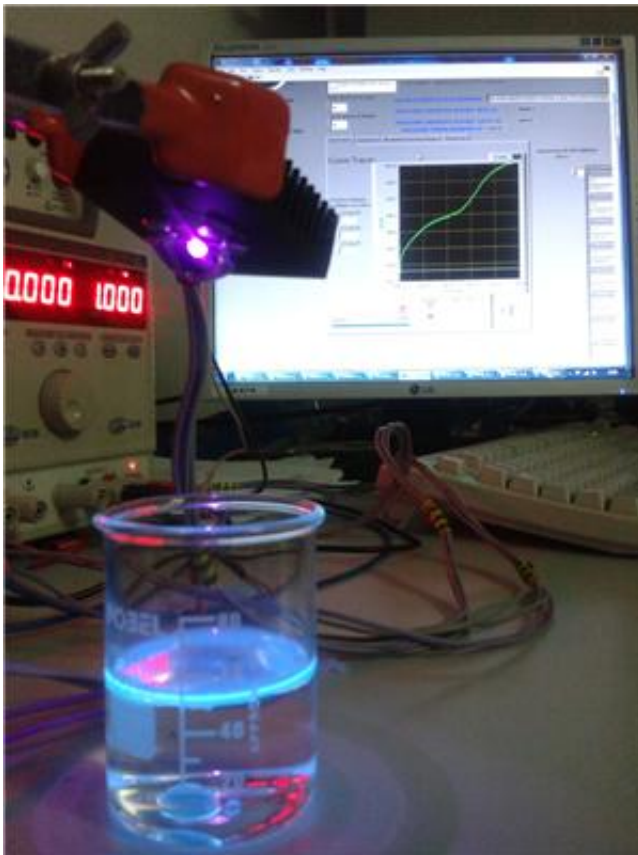
Researchers at UPM are working in the development of hydrocarbon early detection devices for rivers in order to prevent contamination that could seriously affect the environment.

The new devices use ultraviolet LED as [light source](#) that detects contaminant substances thanks to a fluorescence method. This can result in many benefits compared to the current systems due to the

development of faster, more robust and affordable detection systems. These new devices will be useful for the search of potential [dangerous substances](#) present in continental waters, all this according to researchers of the Telecommunication School of the Universidad Politécnica de Madrid (UPM), who are currently studying its viability.

The demand for clean continental waters by European societies and governments is increasing. Thanks to the progress of technological measurement, many contaminants parameters are being measured on rivers and reservoirs (pH, conductivity, oxygen, etc) in order to establish their water quality.

However, there are some contaminants that can be found occasionally (usually by accident) and whose direct identification can be helpful since indirect detection is complex and inexact.



Oil fluorescence produced by an ultraviolet LED. Credit: UPM.

Particularly, hydrocarbons are a type of contaminant that should not be present in water because it can alter wildlife dramatically, and its removal high cost is high. The fluorescence light method is non-invasive and can help to detect contaminant substances. This method can help detect and identify hydrocarbons.

Other researchers working on this matter are more focused on the marine environment and they also use powerful lasers as light sources. Samples are taken to a lab for their identification, but the time factor is very important and can affect this laser method.

Therefore, a study of the light sources available today was required in order to develop a quick, robust and affordable system. This study discarded some lights used in labs such as xenon because they are expensive and require monochromators. LED light has advantages such as small device size, quick response and the ability to transmit pulsed light.

The researchers of this study also found the viability of obtaining predictable patterns of common fluorescence in hydrocarbons that are common contaminants (diesel and petrol in different variants or automotive lubricating oil). These patterns can be found through algorithms. The results confirm the viability of this technique to detect [contaminants](#) in different waters.

**More information:** CAZZOLA, GJ; FAZIO, EA; IZQUIERDO, FA. "Study of the bending response of metal foam-filled beams applied to enhance the rollover behaviour of coach structures". *International*

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