**ATWARM**
Advanced Technologies for Water Resource Management

**Next Generation Autonomous Analytical Platforms for Remote Environmental Monitoring**

Generation of Fully Functioning Biomimetic Analytical Platforms for Water Quality

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**Project Objectives:**

- Integration of actuators into a microfluidic platform:
  - biomimetic structures with detectors
  - fluidic manifolds
  - integral reagent addition and calibration standards
  - integral electronics
  - communications and power generation/storage
- Demonstration of fully functioning analytical platform.

**Wireless Paired Emitter Diode Device as Optical Sensor for Lab-on-a-Disc Water Analysis - Introduction**

**Fig 1.** The schematic of circuit used in the system.

**Fig 2.**
- a) Prototype of the PEDD centrifugal micro-fluidic system,
- b) channel consisting of three chambers. [1]

**Fig 3.** Calibration curve of the sensing area of the microfluidic device using pH buffer solutions. (n=70, error represents the average of light intensity values during data collection).

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**Results**

**Fig 4.** Images of a channel of the CD-chip during centrifugation at 1500 rpm.
- A) the upper chamber is filled with sample, then the disc is spun and all the liquid is transferred to the sensing area (B-D). Solid contents are accumulated in the first chamber (>85µm diameter) (B-D) and at the bottom of the channel (<85µm diameter).

**Fig 5.** Water pH analysis using a commercially available pH-meter and the PEDD lab-on-a-disc device.

**Fig 6.**
- a) Turbidity measurements using a UV-VIS spectrometer (transmittance) and
- b) two channels with river samples; one contents solids in the upper chamber (left) while the other is clean (right).

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**Conferences**


**ANTICIPATED CONFERENCES:**