

## Multiple-Point Raman Spectroscopic Analysis Via Optical Multiplexing

**Track Code:** 2022-SINF-69571

**Categories:**

- Chemistry and Chemical Analysis
- Civil Engineering

**Keywords:**

- Chemistry and Chemical Analysis
- Environmental sensing
- Fiber optic sensor
- In-situ sensing
- Optical multiplexing
- Raman spectroscopy

Researchers at Purdue University have developed a new optical Raman spectroscopy system. Current Raman spectroscopy techniques are not suited for large spatial scales and field - relevant chemical concentrations. The Purdue technology enables Raman analysis at multiple spatially-dispersed locations using a single source-detector unit, facilitating long-term, spatially dispersed monitoring and enabling low cost-per-test-point sensing. This invention has applications to sensing of environmentally- and industrially-relevant compounds, particularly when analysis/monitoring is required at multiple points or over large spatial extent.

**Technology Validation:** In a series of tests, Raman analysis was successfully carried out from a single source and detector unit to examine test points 1 to 16 m from the unit. Modelling of instrument performance demonstrates the potential to reach 1000-2000 m at field-/industrially-relevant concentrations.

**Advantages**

- single detector
- long-term
- spatially-dispersed analysis

**Applications**

- sensing of environmentally-, industrially-relevant compounds

**People:**

- Sinfield, Joseph V (Project leader)
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**Intellectual Property:**

**Application Date:** September 10, 2021

**Type:** Provisional-Patent

**Country of Filing:** United States

**Patent Number:** (None)

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