



Guided-Wave Powered Wireless Sensors

Tech ID: 31988 / UC Case 2019-329-0

SUMMARY

UCLA researchers in the Department of Electrical and Computer Engineering have developed a wirelessly powered, flexible sensor that detects pipe leaks over long distances.

BACKGROUND

While the problem of old and failing pipes has garnered attention, the methods for addressing such failing infrastructure has lagged. Monitoring leaks via sensors on pipe external surfaces could provide constant, real-time monitoring with minimal effort. There is a need for monitoring leaking pipes in the natural gas and petroleum industry.

INNOVATION

Researchers in the UCLA Department of Electrical and Computer Engineering have developed a sensor that wirelessly detects pipe leaks over long distances. The sensor uses guided waves with low attenuation to wirelessly power the sensors. Moreover, the wirelessly powered energy harvesting chips are flexible, compact and readily fit to cylindrical pipe surfaces.

APPLICATIONS

- ▶ Monitoring wellbore casing integrity in oil/gas wells
- ▶ Detect corrosion, change in pH, cracks on pipe external surfaces
- ▶ Wirelessly powered sensors for pipe leak detection

ADVANTAGES

- ▶ Wirelessly powered, no need for battery
- ▶ Detection over long distances
- ▶ Flexible
- ▶ Compact
- ▶ Readily fits to pipe surfaces

PATENT STATUS

Country	Type	Number	Dated	Case
Patent Cooperation Treaty	Reference for National Filings	WO 2021/138268	07/08/2021	2019-329

Patent Pending

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ [A Battery-Less Wirelessly Powered Frequency-Swept Spectroscopy Sensor](#)
- ▶ [Vibration Sensing and Long-Distance Sounding with THz Waves](#)
- ▶ [Broadband Comb-Based Spectrum Sensing](#)
- ▶ [THz Impulse and Frequency Comb Generation Using Reverse Recovery of PIN Diode](#)

CONTACT

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INVENTORS

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OTHER INFORMATION

KEYWORDS

Waveguides, wave propagation,

wirelessly powered micro-sensors,

wirelessly powered energy harvesting

chips, oil and gas leak detection

CATEGORIZED AS

- ▶ **Communications**
 - ▶ Wireless
- ▶ **Environment**
 - ▶ Sensing
- ▶ **Imaging**
 - ▶ Remote Sensing
- ▶ **Sensors & Instrumentation**
 - ▶ Environmental Sensors
 - ▶ Other

RELATED CASES

2019-329-0

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