Analytical Instrumentation, Methods & Materials

NON-INVASIVE MULTIPARAMETER SENSOR

WARF: P230430US01

Inventors: Joseph Andrews, Brian Cardwell, Muhammadeziz Tursunniyaz

The Invention

In conjunction with their industrial partner, UW-Madison researchers have created a passive capacitive sensor that uses thin-film electrodes placed in an interdigitated pattern to sense a variety of key fluid parameters. An electric field is applied between the electrodes, inducing a fringing electric field which can interact with matter out of plane. When interacting with liquid out of plane, it is possible to detect the change in permittivity of the liquid, which can be used to infer physical properties such as the liquid temperature or composition. Additionally, the frequency of excitation can be modified to probe for different parameters simultaneously, essentially achieving an electromagnetic signature that corresponds to the liquid's physical properties. The current embodiment consists of thin copper traces encapsulated in polyimide and can sense temperature directly through measuring the resonant frequency of the sensor, and ethylene glycol concentration in water through the magnitude of the signal reflectance. This can be accomplished non-invasively, with the sensor located in proximity to the liquid (i.e., on the outside of a hose).

Additional Information

For More Information About the Inventors

- Joseph Andrews

Tech Fields

- Analytical Instrumentation, Methods & Materials : Sensors

For current licensing status, please contact Michael Carey at mcarey@warf.org or 608-960-9867