LICENSING OPPORTUNITY: OPTICAL FLOW METER

DESCRIPTION

Invention

NIST scientists have developed an optical flow meter that can continuously measure flow in the nanoliter per minute range. Over the instrument's dynamic range, the relative uncertainty in flow rate remains constant and can be controlled to within 5% or better. No existing technology can simultaneously achieve these performance metrics. Moreover, for applications such as leak detection, the instrument can be operated in a secondary mode that detects changes on the order of tens of picoliters per minute about zero flow.

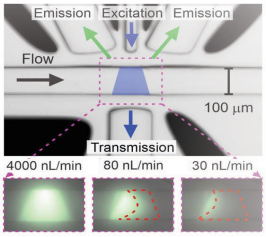
BENEFITS

Potential Commercial Applications

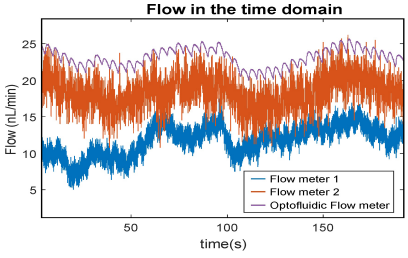
The invention can be integrated into existing microfluidic technologies as an in situ meter and thus become part of existing microfluidic devices. It could function, for example, as part of a flow control, chemical analysis, or particle/cell measurement system.

Competitive Advantage

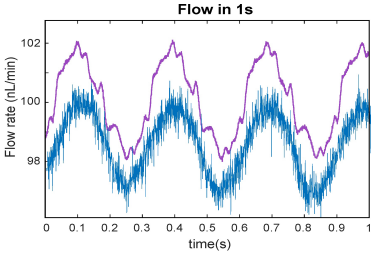
- World's most accurate continuous flow meter in the nanoliter per minute range
- Dynamic range can be adjusted across many decades of flow rates
- Secondary zero-flow mode's calibration data can be used to increase the dynamic range and decrease uncertainty in other instrumentation
- Zero-flow mode also provides a first-of-its-kind, high-sensitivity method for leak detection in the picoliter-per-minute range
- Adaptable to other applications such as flow cytometry, mass spectrometry, and drug delivery
- Response time is faster than traditional flowmeters at the nanoliter/min scale. Moreover, response time is independent of flow rate in typical operating modes



The optofluidic flowmeter determines flow rate by measuring the amount of photobleaching in a dye such as fluorescein.



Comparison of NIST flow meter with commercial meters using a 25 nL/min pump (note fine detail of individual motor clicks in the pump mechanism).



Comparison of extreme dynamic sensitivity of NIST flow meter with mechanically perturbed flow set nominal flow rate of 100 nL/min.

Contact: licensing@nist.gov

NIST TECHNOLOGY PARTNERSHIPS OFFICE

NIST Technology Partnerships Office
National Institute of Standards and Technology
100 Bureau Drive, Gaithersburg, MD 20899-2200