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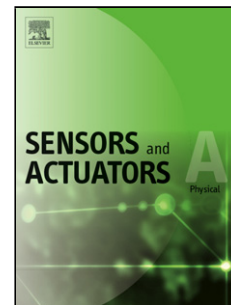
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Optical fiber sensor system for remote and multi-point refractive index measurement

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Abstract. A Fresnel-reflection-based RI sensor using SMF fiber tips as sensing points interrogated by multi-wavelength OTDR from a distant location (up to several tens of kilometers) has been reported. The advantage of the system compared to previous work is that the distance between sensor points is not limited by the spatial resolution of OTDR. Experimental work demonstrated that the proposed sensor is capable of measuring refractive index of liquid chemicals with a precision of 1.7×10^{-4} . This sensor prototype have strong conveniences (simple installation requirements, fast response and reliability in harsh environment) compared to previous Fresnel-based RI sensors which makes it a very good option for environmental monitoring systems.

Keywords: fiber optics sensors, Fresnel reflection, OTDR, refractive index sensing.

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