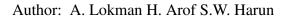
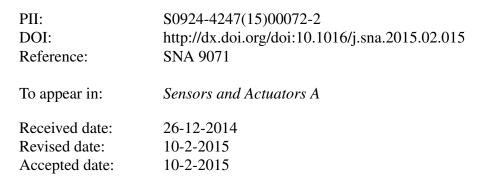
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Title: Tapered Fiber Coated with Hydroxyethyl Cellulose/Polyvinylidene Fluoride Composite for Relative Humidity Sensor





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2	Tapered Fiber Coated with Hydroxyethyl Cellulose/Polyvinylidene Fluoride
3	Composite for
4	Relative Humidity Sensor
5	
6	
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16	Abstract
17	A new evanescent wave based sensor is proposed and demonstrated using a silica fiber
18	interferometer coated with Hydroxyethyl Cellulose/Polyvinylidene Fluoride (HEC/PVDF)
19	composite. The performance of the sensor is investigated for two different types of
20	interferometer structure: inline Mach Zehnder Interferometer (MZI) with dumbell structure and
21	non-adiabatic etched fiber. The measurement is based on interferometric technique where the
22	transmission spectrum of the reflected light is investigated for changes in relative humidity. For
23	instance, the resonant dip wavelength for MZI dumbbell shape increases from 1555.76 to
24	1556.34 nm as the RH increases from 10 to 80%. While, for etched SMF the resonant dip
25	wavelength increases from 1554.58 to 1554.85nm as the RH increases from 10 to 80%. Both
26	sensors demonstrated a linear shift especially within a range from 20 to 45%. It is found that the
27	MZI-based sensor has a sensitivity of 0.0123nm/% with a linearity of 99.88% and limit of
28	detection of 0.44%. On the other hand, the etched SMF structure also shows change in the
29	resonant wavelength with the increase in RH. The tapered fiber based sensor has a sensitivity of
30	0.0074nm/% with linearity of 98.85% and limit of detection of 0.65%. The lower limit of

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