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Author Correction: Comprehensive Modeling of Multimode Fiber Sensors for Refractive Index Measurement and Experimental Validation

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Correction to: *Scientific Reports* <https://doi.org/10.1038/s41598-018-24153-0>, published online 12 April 2018

The original version of this Article contained errors in Equation 7, which was incorrectly given as:

$$T = \frac{\alpha \lambda n_{co} \cos \theta}{\pi n_{sm}^2 \cos^2 \theta_{csm} \sqrt{\cos^2 \theta_{csm} - \cos^2 \theta}}$$

The correct Equation 7 appears below.

$$T = \frac{\alpha \lambda n_{sm} \cos \theta}{\pi n_{co}^2 \cos^2 \theta_{csm} \sqrt{\cos^2 \theta_{csm} - \cos^2 \theta}}$$

As a result of the changes to Equation 7, the Abstract,

“The sensors can be employed over a very wide dynamic RI range from 1.316 to over 1.608 at a wavelength of 1550 nm, with the best resolution of 2.2447×10^{-5} RI unit (RIU) obtained in Zone II for a 1-cm sensor length.”

now reads:

“The sensors can be employed over a very wide dynamic RI range from 1.316 to over 1.608 at a wavelength of 1550 nm, with the best resolution of 2.2406×10^{-5} RI unit (RIU) obtained in Zone II for a 1-cm sensor length.”

Additionally, in Figure 5a, the unit of fiber diameter “ μm ” was incorrectly given as “mm”.

The original Figure 5 and accompanying legend appear below.

In the final paragraph of the Discussion,

“It is also in this Zone that the 2.5-cm and 4-cm sensors have the best relative resolutions of 2.9919×10^{-5} RIU and 3.2634×10^{-5} RIU, respectively, compared to the other two Zones. For Zone I, the best resolution is achieved by the 4-cm long sensor with a minimum detection level of 1.5438×10^{-3} RIU while the 1-cm and 2.5-cm sensors are capable of resolutions of 5.1952×10^{-3} RIU and 1.7462×10^{-3} RIU, respectively.”

now reads:

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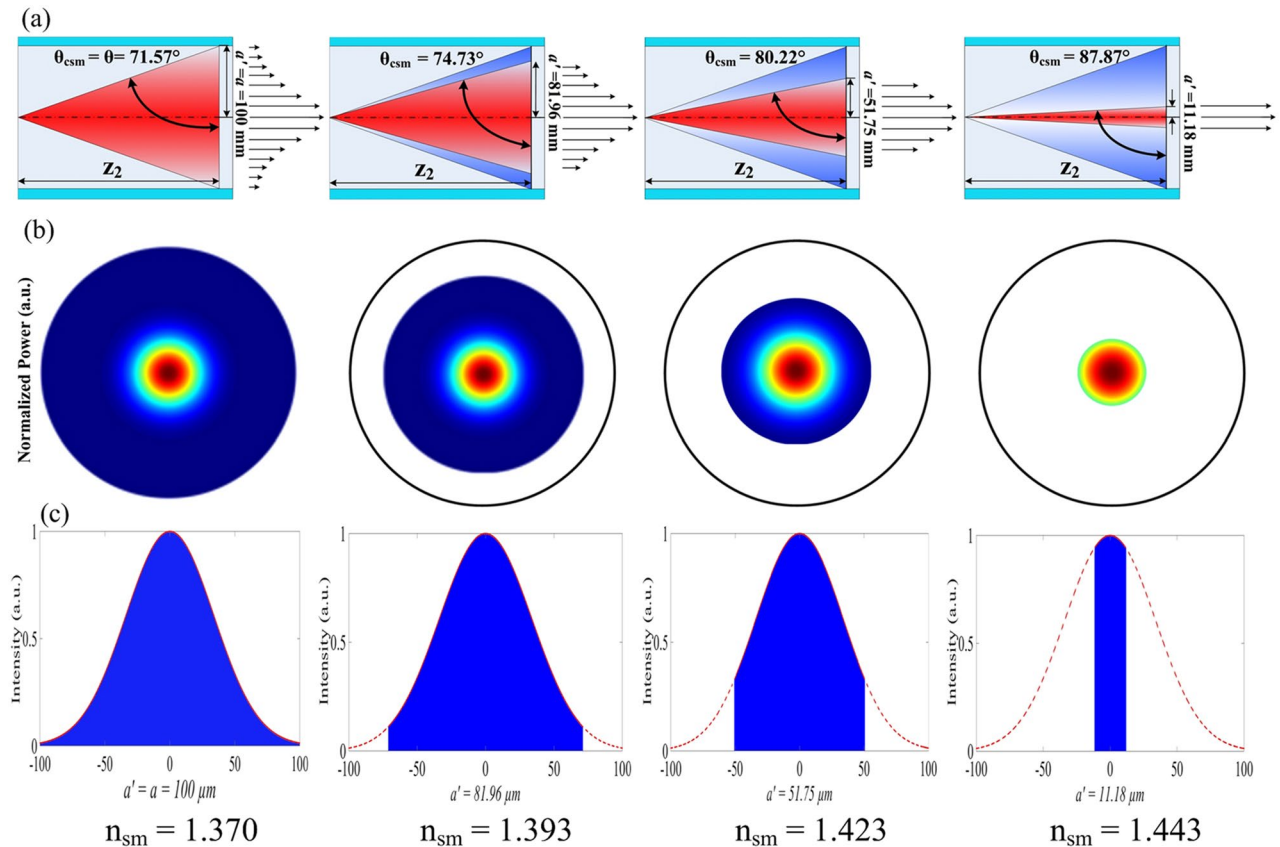


Figure 5. Evolution of optical power and intensity in the MMF RI sensor for various values of n_{sm} by modification of the critical angle, θ_{csm} , for $n_{cl} < n_{sm} < n_{co}$. (a) increasing n_{sm} will increase θ_{csm} which reduces the acceptance angle of the propagating beam, (b) power in transversal plane decreases for increasing n_{sm} , and (c) illustrates decreasing optical intensity over different a' obtained by Equation (14).

“It is also in this Zone that the 2.5-cm and 4-cm sensors have the best relative resolutions of 2.9847×10^{-5} RIU and 3.2517×10^{-5} RIU, respectively, compared to the other two Zones. For Zone I, the best resolution is achieved by the 4-cm long sensor with a minimum detection level of 1.6116×10^{-3} RIU while the 1-cm and 2.5-cm sensors are capable of resolutions of 5.5905×10^{-3} RIU and 1.7528×10^{-3} RIU, respectively.

In the second paragraph of the Conclusions,

“For Zone II, the best sensor resolution of 2.2447×10^{-5} RIU is achieved for the 1-cm sensor.”

now reads:

“For Zone II, the best sensor resolution of 2.2406×10^{-5} RIU is achieved for the 1-cm sensor.”

Lastly, as a result of the changes to Equation 7, the data in Table S1, S2, S3, S5, S6 and S7 in the Supplementary Information was incorrect.

The original Supplementary Information file is available below.

The original Article and accompanying Supplementary Information file has now been corrected.

Additional information

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1038/s41598-021-99941-2>.



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