

NEW PROCESS USED TO ENHANCE HIGH SENSITIVITY AND DETECTION LIMIT OF MICRORESONATORS

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Value Proposition: *A cost-effective packaging technique that uses non-toxic polydimethylsiloxane to protect and enhance function of WGM devices.*

Technology Description

Researchers at Washington University in St. Louis have developed a new process used to package optical whispering gallery mode (WGM) microresonators devices using non-toxic polydimethylsiloxane (PDMS) that helps with robustness (protects from humidity) and compactness, while achieving high Q-factor to ensure high sensitivity and low detection limit.

Conventional packaging for WGM devices uses UV curable polymers with low refractive indices - they are costly and toxic and susceptible to humidity-related degradation. This new packaging technique not only endows the WGM device with better robustness, stability, and compactness but also enhances the humidity resistance significantly.

Stage of Research

Early device testing

Publications

J. Liao, A. Qavi, M. Adolphson and L. Yang, "High-Q WGM Resonators Encapsulated in PDMS for Highly Sensitive Displacement Detection," in *Journal of Lightwave Technology*, vol. 41, no. 9, pp. 2862-2869, 1 May 2023, doi: 10.1109/JLT.2022.3182627.

Applications

- Packaging for WGM microresonators
- Photonic device protection and integration

Key Advantages

- Allows for enhanced robustness, stability, and compactness
- Improves humidity resistance

- Less costly than conventional packaging methods
- Non-toxic packaging material

Patents

Patent application filed

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