OPTICAL SENSING TECHNOLOGY TAILORED FOR ADVANCED INDUSTRIAL APPLICATIONS

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High-resolution, integrable, and reconfigurable optical inline platforms have become indispensable for enabling next-generation photonic technologies. In particular, hydrophones for underwater mapping, optical profilometers, magnetometer and optical flowmeter have substantially benefited from advances in high-resolution cavity interferometers that exploit the excitation of fundamental and higher-order modes in processed fibers, microfibers, and their hybrid configurations [1–2]. At the same time, strong light–matter interactions have been realized by integrating optical nanowires with diverse quantum emitters, including nitrogen-vacancy centers embedded in asymmetric elliptical-faceted diamond nanowires (ELFA) [3] and nanophotonic cavities formed by periodic rectangular through-hole etching on optical nanowires [4-5]. These cavity-enhanced structures facilitate efficient unidirectional and/or bidirectional coupling of single photons emitted from such quantum systems.

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