Special Issue

Advances in Optical Fiber-Based Sensors

Message from the Guest Editors

Optical fiber-based pressure sensors possess several advantages, including immunity to electromagnetic interference and the capability to function in challenging environments. Nevertheless, there are still some challenges, such as the need for heightened sensitivity, miniaturization, and cost-effectiveness. Researchers are actively tackling these challenges by exploring innovative materials and fabrication techniques. On one front, it is feasible to elevate the performance of Fabry–Perot pressure sensor substrates or pressure-sensitive structures through the exploration of novel materials like crystals, ceramics, and alloy metals. On the other hand, delving into new Fabry–Perot structure fabrication processes, such as Micro-Electro-Mechanical Systems (MEMS), laser engraving, 3D printing technology, and others, offers the potential to enhance the stability and uniformity of sensor structures, thereby improving key performance parameters such as accuracy, repeatability, and linearity. In summary, the integration of optical fiber sensors with technologies from other fields is poised to drive groundbreaking advancements in pressure sensing and monitoring systems.

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