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MEMS/NEMS Sensors

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Due to the ever-expanding applications of micro/nano-electromechanical systems (NEMS/MEMS) as sensors and actuators, interest in their development has rapidly expanded over the past decade. Encompassing various excitation and readout schemes, the MEMS/NEMS devices transduce physical parameter changes, such as temperature, mass or stress, caused by changes in desired measurands, to electrical signals that can be further processed. Some common examples of NEMS/MEMS sensors include pressure sensors, accelerometers, magnetic field sensors, microphones, radiation sensors, and particulate matter sensors.

Despite a long history of development, fabrication of novel MEMS/NEMS devices still poses unique challenges due to their requirement for a suspended geometry; and many new fabrication techniques have been proposed to overcome these challenges. However, further development of these techniques is still necessary, as newer materials such as compound semiconductors, and 2-dimensional materials are finding their way in various MEMS/NEMS applications, with more complex structures and potentially smaller dimensions.



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