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Novel Sensor Technologies for Civil Infrastructure Monitoring

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The increasing frequency of harsh environmental and climatic conditions and long design reference periods have had an adverse impact on civil infrastructures, including buildings, railways, bridges, tunnels, highways, airports, pipelines, roads, power plants, industrial facilities, geotechnical and hydraulic structures, and others. Such events can cause several geotechnical health problems, leading to settlement, cracking, slope instability, deformations, and many more issues. Accordingly, it is critical to accurately and precisely monitor the mechanical behavior of civil infrastructures. Civil infrastructure monitoring with the aim of early damage detection and acquiring the data required for engineering construction not only prevents sudden infrastructure collapse but also increases service life and sustainability. Currently, various sensing technologies are being rapidly developed in line with the deeper and more extensive research on new principles, new materials and new technologies. In view of its higher accuracy, smaller volume and stronger adaptability, novel sensor technology has a significant role in satisfying the high requirements for resilient and sustainable civil infrastructures. Various types of novel sensors with new principles, new materials or new technologies, including the following, would provide new ways to assist in the green and high-quality development of civil engineering infrastructures.

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