

## NANOLAYERS – NEW POSSIBILITIES IN FIBER-OPTIC SENSORS

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In the last decade, fiber-optic sensors gained popularity as sensing devices in many fields e.g. energy, technology, life science. This was possible because of the design and the integration of new materials into the fiber-optic technology.

Fibre-optic sensors have several advantages in comparison to electronic sensors of the same size. Due to the fact of using dielectric materials they are insensitive to electric and magnetic fields that are generated by the devices used for diagnostics and medical therapy. Additionally, they are not sensitive to chemical agents and ionizing radiation. It is worth noting that the fibre-optic sensors can be implemented with the transmitters of various physical quantities and that they can usually be produced in a relatively cheap way. The small dimensions of such sensors (below hundreds of micrometers) allows to avoid the appearance of distortions in the investigated area, allowing at the same realization of almost pointwise measurements. Furthermore, while using the low-coherence interferometry, such a sensor is insensitive to changes in the intensity of the optical signal in the transmission system, since all the information about the measured values is included in the frequency components of the measuring signal spectrum.

This lecture gives a general view on the fiber-optic sensors with nanolayers, their properties and selected application. Especially, the nanolayers made from various carbon-based materials, like: nanocrystalline diamond (NCD), boron-doped nanocrystalline diamond (B-NCD) and nitrogen-doped nanocrystalline diamond (N-NCD) and non-carbon-based, like: zinc oxide (ZnO), titanium dioxide (TiO<sub>2</sub>), aluminum oxide (Al<sub>2</sub>O<sub>3</sub>) which successfully applied in the construction of fiber-optic sensors.