PATENT

A STRETCHABLE OPTO-MECHANICAL MATERIAL COMPOSED BY A METALLIC AND OR DIELECTRIC NANOSTRUCTURE ARRAY EMBEDDED INTO A WRINKLED ELASTOMER

The need

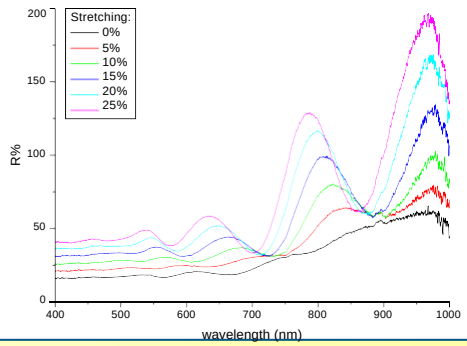
New wearable diagnostic devices
Optical pressure sensors
Tunable optical filters

The Solution

The present invention describes a new material with opto-mechanical behavior that solves the problems of the devices and methods of the state of the art.
This innovative technology allows the development of new stretchable optical devices with larger mechanical tunability, versatility and sensitivity, as well as to simplify their fabrication and improve the robust integration.

Innovative Aspects

The present invention discloses a novel soft stretchable enhanced Fabry-Perot (FP) cavity. The FP cavity is composed of arrays of nanostructures, showing plasmonic and/or dielectric resonances, which are self-integrated into elastomeric films by a highly innovative self-swallowing process. The process that the inventors disclosed shows the spontaneous swallowing of a plurality of metallic, dielectric or dielectricmetal coated nanostructures into the elastomer matrix and the wrinkle formation.
The opto-mechanical response, of the self-embedded arrays of nanostructures, provides theoretical and experimental demonstrations of the plasmonic enhanced and Fabry-Perot optical modes, together with the influence of the wrinkled elastomeric films surface, as polydimethylsiloxane (PDMS) surface.
The invention describes a process to obtain the material, a sensor comprising an active layer of the material, and their use as part of a device to change light transmittance.



Stage of Development: Validation of the lab prototype and ready for clinical validation

Intellectual Property

International patent application WO2022/084309A1

Available for
Licensing or Assignment

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