

Our new paper in Journal of Physics D: Applied Physics

Congratulations to our new paper " Electrically driven flexible two dimensional plasmonic structure based on nematic liquid crystal " by Hossein Mbarak, Seyedeh Mehri Hamidi, Ezeddin Mohajerani and Z Zattar

A novel two dimensional active plasmonic grating based on liquid crystal (LC) infiltration is demonstrated by combining the plasmonic properties of the gold nanostructure and the optical properties of the liquid crystal. In this structure, a thin layer of E7 liquid crystal was typically injected onto a gold nanostructure, deposited on a PDMS substrate, using nanoimprint lithography method. The surface plasmon resonance (SPR) of the fabricated plasmonic structure can be controlled by changing the refractive index of LC, which was achieved with an external electric field. LC molecules confined between the gold nanostructure and an indium-tin-oxide (ITO) glass are randomly aligned, and they can exhibit a reversible refractive index, depending on their orientation under the external voltage and the polarization of the incident light. Results demonstrates that the wavelength of the resonance peak can be red shifted by the electric field-dependent refractive index of liquid crystal. This experimental work provides us an active control of surface plasmon resonance using liquid crystal which can act as an ideal active medium for different applications such as low voltage sensor with the sensitivity of 0.4375nm/V .

