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**An optically excited LC in-plane switching driven by localized surface plasmon resonance**[1] MAKIKO TSUKAMOTO QUINT, University of California, Merced — We probe a new way to control a molecular orientation in a few micron thick liquid crystal (LC) films by utilizing the localized surface plasmon resonance (LSPR) of gold nano-particles (AuNPs). This LC molecular re-orientation is reversible and repeatable, and does not require any specific alignment coatings and additional applied electric field. Our LC thin film has AuNPs deposited on either single or double side of our glass slides with peak absorption at 532 nm wavelength. We measure the LC switching time-scales and threshold power requirements for both single and double sided AuNP deposition LC thin films. Additionally, the total transmission intensity increases strongly with incident power, but shows weak dependence with temperature. Moreover, we control and vary the in-plane switching of the LC molecules by altering the directionality of linear polarization of an incident beam. Based on our experimental results, our thin LC film with AuNPs has the potential to act as an optically excited LC switch and this will introduce a new approach and performance of LC devices.

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