

Title: **Plasmonic studies on a 5-layer electrovariable window-mirror system with MoS₂ and WS₂**

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Date: 15th May 2020

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Over the last years, many plasmonic studies concerning nanoparticle film reflection led to the chance of building a system which could switch between a window and a mirror. The existence of decades of work allowed the realization of tunable self-assemblies of nanoparticles, which by applying a small voltage could be transformed from a solution of nanoparticles dispersed in the bulk into a reflective film and vice versa. These systems have been discovered relatively recently and hold promise for several applications such as new metamaterials or energy-saving structures. Here, we report a study of a 5-layer electrotunable window-mirror system, highlighting how it works and its main characteristics. Furthermore, a substrate with optical properties is established in the third layer, which acts as a deposition electrode when the gold nanoparticle film is assembled. This substrate is established with the hypothesis that it may have plasmonic interaction with the nanoparticles and get some coupling. Substrate situations are explored for the case of MoS₂ as well as for the case of WS₂. As a result of this study, a computer program has been developed to evaluate the probability that the reflectivity of the global system got enhanced not only by a coupling of the substrate and the nanoparticle film causing some change in reflection. Application of this program to all formula concerning each layer has allowed to conclude that the hypothesis seems to agree with the results obtained for both cases.

Keywords: plasmonic, nanoparticle, electrovariable, window, mirror, 5-layer system, substrate