Our new paper in international journal of optics and photonics

Congratulations to our new paper “Adjustable plasmonic bandgap in one-dimensional nanograting based on localized and propagating surface plasmons” by Foozieh Sohrabi and Seyedeh Mehri Hamidi.

Compared to the long history of plasmonic gratings, there are only a few studies regarding the bandgap in the propagation of plasmonic surface waves. Considering the previous studies on interpretation of plasmonic bandgap formation, we discuss this phenomenon using the effect of both surface plasmon polariton (SPP) and localized surface plasmon (LSP) for our fabricated one-dimensional metallic-polymeric grating. This structure is composed of metallic grating on the surface of PDMS with different concentration of embedded gold nanoparticles. By sweeping the incident angles, we have seen that the SPP, LSP and their coupling cause two gaps in reflection regime which are originated from SPP supported by thin film gold film and LSP supported by gold nanoparticles. The first gap is attributed to the patterned metallic film because it vanishes by increasing the nanoparticles which may destroy the pattern while the second gap can be formed by embedded

nanoparticles because it
becomes more considerable by raising the incubation time. Therefore, the drowning time of patterned
samples (e.g. 24h. 48h and 72h) in HAuCl4 plays the key role in adjustability
of plasmonic bandgap. Notably, the interaction between SPP and LSP can be the
origin of the shift in gap center from 300 to 550. To best of over knowledge,
this study is the first study on the plasmonic band gap as a function of both
SPP and LSP.