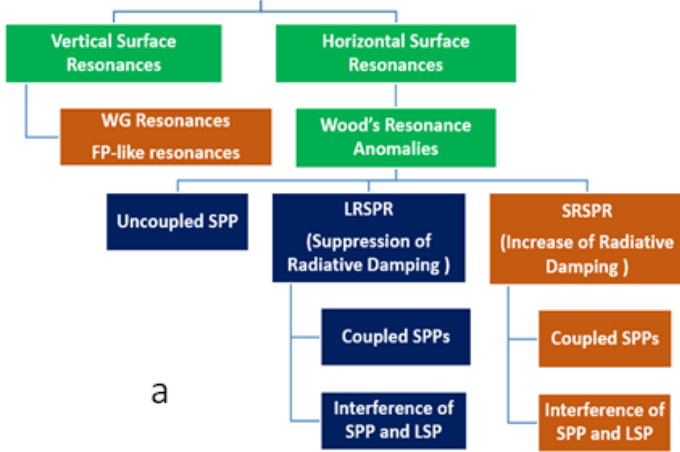


Our new paper in journal of optical and quantum electronics

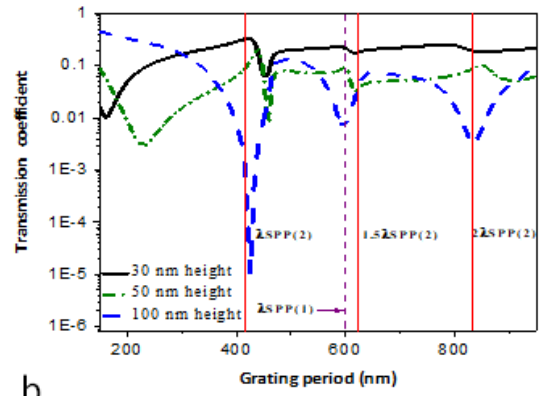
Congratulations to our new paper "Role of higher order plasmonic modes in one-dimensional nanogratings " by Foozieh Sohrabi, Seyedeh Mehri Hamidi, Ershad Mohammadi

By theoretically investigating the optical behavior of one-dimensional gold nanogratings using Fourier Modal Method, we have shown that both integer and non-integer multiples of surface plasmon polariton wavelengths should be taken into consideration in special optical contrast ratio for highly sensitive sensing. The emergence of higher modes is the key factor for the formation of observed plasmonic band gap. Through considering the significant role of grating period and thickness respectively in horizontal and vertical surface resonances, it was demonstrated that for gold thicknesses below 100 nm, the dominant phenomenon is horizontal surface resonances while for increased thicknesses both horizontal and vertical surface resonances mediate. The transmission minima are insensitive to the grating thickness, which confirms that their origins are not vertical surface resonances. This study can open an avenue towards designing highly sensitive sensors with focus not only on the plasmonic resonance wavelength but also on its integer and non-integer multiples whose origins should be investigated in both horizontal and vertical surface resonances.

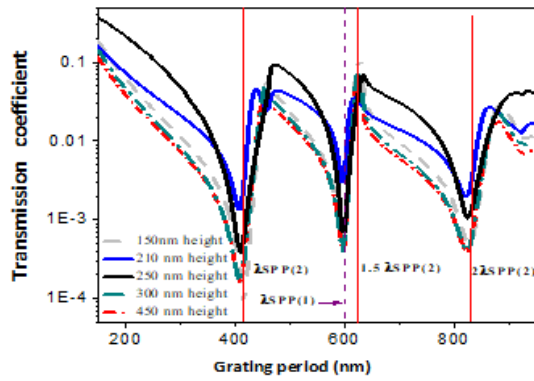
Mode Analysis in 1D gratings



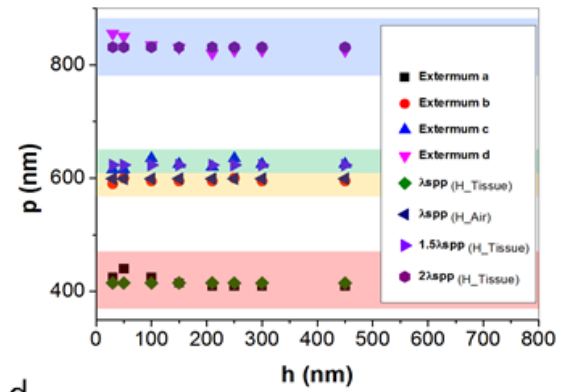
a



b



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