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Microcavities for whispering gallery mode observation

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In this presentation we will exploit the base principle of our biosensor altogether with the current experimental results. The physical phenomena which will be used for the detection will be the whispering gallery modes. This effect is formed under the condition where light experiences constructive interferences while travelling inside at the circumference of a circular media. Consequently, we will also have formation of a strong evanescent field. Usually, to achieve the aforementioned effect, spherical structures can be used, but in our case, we use cylindrical microcavities called micropillars. The evanescent field will indeed allow us to excite biological molecules allowing their detection through fluorescence. As substrate for the system we use glass cover slips covered in titanium and gold in order to reduce the optical losses. Then a layer of negative photoresistive material is spin-coated on top, which we later cross-ling under UV light with a 405nm laser. By setting the parameters for the spinning of the sample and the light exposure we can easily control the dimensions of the micropillars in terms of height and diameter. After the fabrication process is concluded and we can observe the pattern of micropillars, then we proceed in the characterization. To do so, we illuminate the micropillar from the side and then we collect the excitation spectra of it. In the current state we are able to observe the resonant peaks of the whispering gallery modes for different samples with different parameters.

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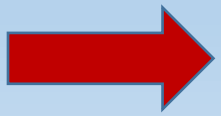
Wednesday, 21th December, 2022 – 16.00 pm  meet.google.com/xxi-nvvd-dwc

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