Supplemental Document

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Enhancement of lossy mode resonance sensing properties by the introduction of an intermediate low-refractive-index layer: supplement

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Enhancement of lossy mode resonance sensing properties by introduction of an intermediate low refractive index layer: Supplement 1

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Field characterization

According to the analysis of data shown in Fig. 4, the transversal magnetic field of mode TM_0 was calculated for surrounding medium refractive index equal to 1 at wavelengths 450, 510, 570 and 630 nm, covering the range where the LMR is located for different intermediate layer thickness values: 0, 150, 350, 550, 700, 850 and 1000 nm (see Fig. S1). For the simulations we used the finite difference method (FDM) implemented in FIMMAVE software with Quasi 2D version. We have focused on analysis of transversal magnetic field due to the fact that it is continuous on the interfaces and hence easier to interpret than the electric field.

In Fig. S1 can be found that when no intermediate layer is present, thickness 0 nm under a 80 nm TiO2 LMR-generating coating, the evanescent field decays more gradually than when the intermediate layer is applied. In fact, the decay is more intense with increase of the intermediate layer thickness. This fact explains broader LMR when no intermediate layer is present. Simultaneously, lower intensity of evanescent field observed for higher intermediate layer thickness explains the lower sensitivity of the LMR at these conditions (see Fig. 6).

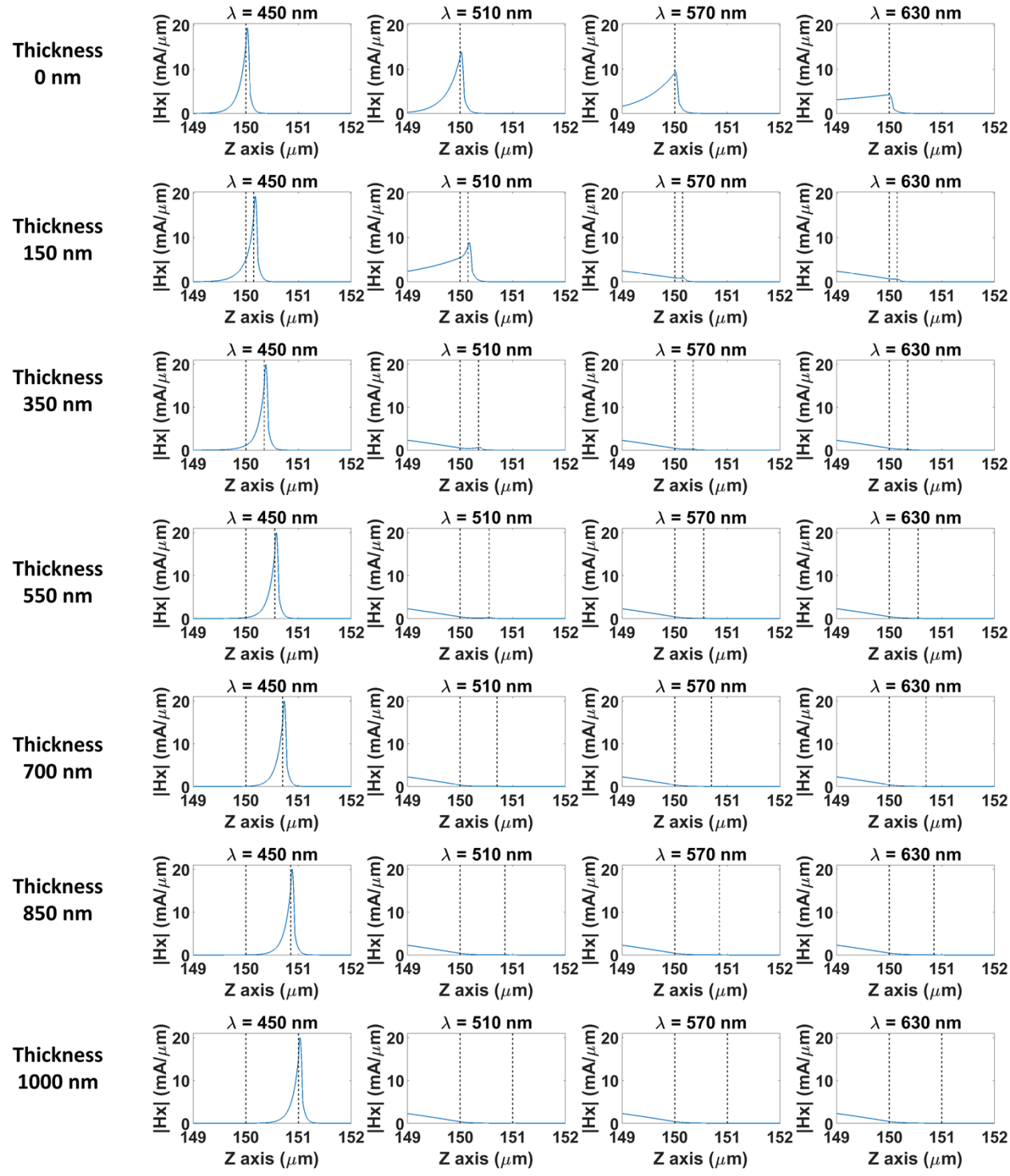

Fig. S1. Transversal magnetic field of fundamental mode TM0 in the upper part of the cross section of the 150 µm coverslip coated with SiO2 intermediate layer of 0, 150, 350, 550, 700, 850 and 1000 nm thickness at wavelengths 450, 510, 570 and 630 nm.