

Abstract Submitted  
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**Whispering-Gallery Modes in Quantum Dot-Embedded Microspheres** HOPE BEIER, NRC/Air Force Research Laboratory, KENITH MEISSNER, Texas A&M University — Optical resonances, known as Whispering Gallery Modes (WGMs), from quantum dot embedded polystyrene microspheres offer potential for remote detection of molecules adsorbed onto or bound to the microsphere surface. The total internal reflection of the quantum dot (QD) emission light within the high index polystyrene microsphere produce narrow spectral peaks that shift position with variations in the local refractive index sampled by the evanescent tail of the WGMs. QD-embedded microsphere response has demonstrated increased sensitivity over theoretical predictions for a homogeneous microsphere. By considering the embedded QDs as a high index outer layer, the positions, Q-factor, and sensitivity of the WGMs were modeled. This model, along with estimates of the QD-layer index and penetration depth, was used to relate the locations and sensitivities of the modes to our experimental results with strong agreement between the two.

Hope Beier  
NRC/Air Force Research Laboratory

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