

Abstract Submitted
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Frequency Shift of Polar Whispering Gallery Modes Caused by Uniaxial Stress¹ H. -P. WAGNER, University of Cincinnati, H. SCHMITZER, Xavier University, J. LUTTI, P. BORRI, W. LANGBEIN, Cardiff University — Optical whispering gallery modes in small spheres -so called microcavity optical resonators- have been investigated in the past years because they are promising as single virus or single bacterium detectors and as pressure sensors for microfluidic applications. Due to high Q-factors whispering gallery modes are very sensitive to changes of the shape and the refractive index of the sphere. Both can be caused by mechanical stress. A small exerted compressive force will therefore lead to an energy shift of the resonant modes. The relationship between this energy shift and the exerted force depends on the geometry of the experimental setup. We investigated the energy shift of polar modes in polystyrene beads of 45 micron diameter applying an uniaxial force. With increasing force we find a shift to higher energy for resonator modes with different mode order n and number l . The observed results will be compared with model calculations.

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