

Abstract Submitted  
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**Demonstration of a Novel Micro-Optical Wall Pressure Sensor Concept Based on Whispering Gallery Mode Resonators<sup>1</sup>** TINDARO IOPPOLO<sup>2</sup>, ULAS AYAZ<sup>3</sup>, VOLKAN OTUGEN<sup>4</sup>, Southern Methodist University — We present a novel micro-optical wall pressure sensor concept based on the optical resonance (whispering gallery mode or WGM) shifts of polymeric spheres. The spherical resonators, which are typically a few hundred microns in diameter, serve as the sensing element. The pressure acting on a polymeric membrane flush with the wall is transmitted by simple contact with the microsphere. The force acting on the microsphere in the contact region perturbs its morphology (both its shape and refractive index) leading to a shift in its WGM. By measuring these changes in the resonance frequency, measurements of wall pressure is accomplished. Due to the unusually large optical quality factors associated with sphere WGMs, pressure measurements with extremely high sensitivity are possible.

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