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Pressure sensing using fiber Bragg gratings in oceanography

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Abstract

Pressure and temperature are fundamental properties of the oceanic water. They have varying effects on the processes that take place in oceans: be they biological, physical or chemical. Pressure always increases with respect to surface, when one goes down; temperature has a more complex variation with respect to the depth. Various tools and techniques are available to measure these properties.

This paper presents the pressure sensing using Fiber Bragg Grating (FBG) sensors for oceanography based on the proposed two novel sensor heads, the first sensor head comprises an FBG fixed between silicon rubber foil and sensor head wall while in the second, the FBG is fixed between two silicone rubber foils. The pressure on walls of silicon rubber foils elongates FBG, which results in shift of Bragg wavelength. Theoretical and experimental studies carried out on these proposed sensor heads resulted in pressure sensitivity of about eight times greater than that of bare FBG. Further, the proposed sensors have shown good linearity and stability.

Biography

G. R. C Reddy graduated from Osmania University with majors in Mathematics, Physics and Chemistry. He obtained his M.Sc. (Tech) in Engineering Physics and Ph.D from Faculty of Engineering and Technology, REC (NIT) Warangal. His research area focuses on Optical Information Processing. He joined as a faculty in the Department of Physics at NIT Warangal in 1979 and became full Professor in 1995. He served as the director of NIT Calicut between 2005 and 2010 and presently he is the Director of NIT Goa. He was the principal investigator in number of research projects sanctioned by CSIR, MHRD, and DRDO etc. He published over 80 research papers in various National and International journals/Conference proceedings. He is a Fellow of Optical Society of India, Member of SPIE and OSA.