

3.1-P19. New optical microbarometer

Transducers implemented in microbarometer are mainly composed of two associated elements. The first one converts the external pressure variation into a physical linear displacement. The second one converts this motion into an electrical signal. According to this configuration, MB3, MB2000 and MB2005 microbarometers are using an aneroid capsule for the first one, and an electromagnetic transducer (Magnet-coil or LVDT) for the second one. We think that changing the electromagnetic transducer by an interferometer is a solution to increase the dynamic and the resolution of the sensor. Firstly, we will present the new transducer principles, considering the aneroid capsule and the interferometer using integrated optics technology. Secondly, we will present the first part of this project in which the interferometer is positioned outside the aneroid capsule. In this configuration, interferometer mechanical adjustments are easier, but measurement is directly disturbed by environmental effects like the thermal variations. Six prototypes and an optical digitizer were specifically designed. Then, we will present the first measurement results compared to those of a MB2005 microbarometer. Finally, a new design of the optical microbarometer will implement the interferometer into the aneroid capsule under vacuum to protect the optical measurement from environmental effects.

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