

THERMODYNAMIC ASPECTS OF DYNAMICAL CALIBRATION OF MICROBAROMETERS USED FOR IMS APPLICATIONS

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One of the IMS technical specifications for infrasound station requires that the microbarometer frequency response should be known within the 5% accuracy. Meeting of this specification has need of precise methods of microbarometer dynamical calibration within the sensor frequency passband. The general and well-known technique of dynamical calibration of a microbarometer is to use the known pressure changes simulated by the volume changes in the special chamber attached to the microbarometer. The physics of this method is based on the thermodynamic process occurring inside the closed volume and on the corresponding relationships between pressure, volume and temperature changes caused by the movement of the piston attached to the inlet of the chamber. However, simulating of the pressure oscillations by changing the volume of the calibration chamber requires more precise theoretical consideration of this process in light of required accuracy of calibration.

The presentation provides an insight to the whole thermodynamic process inside of the calibration volume and discusses the potential impact on the accuracy of calibration the ignorance of these details.