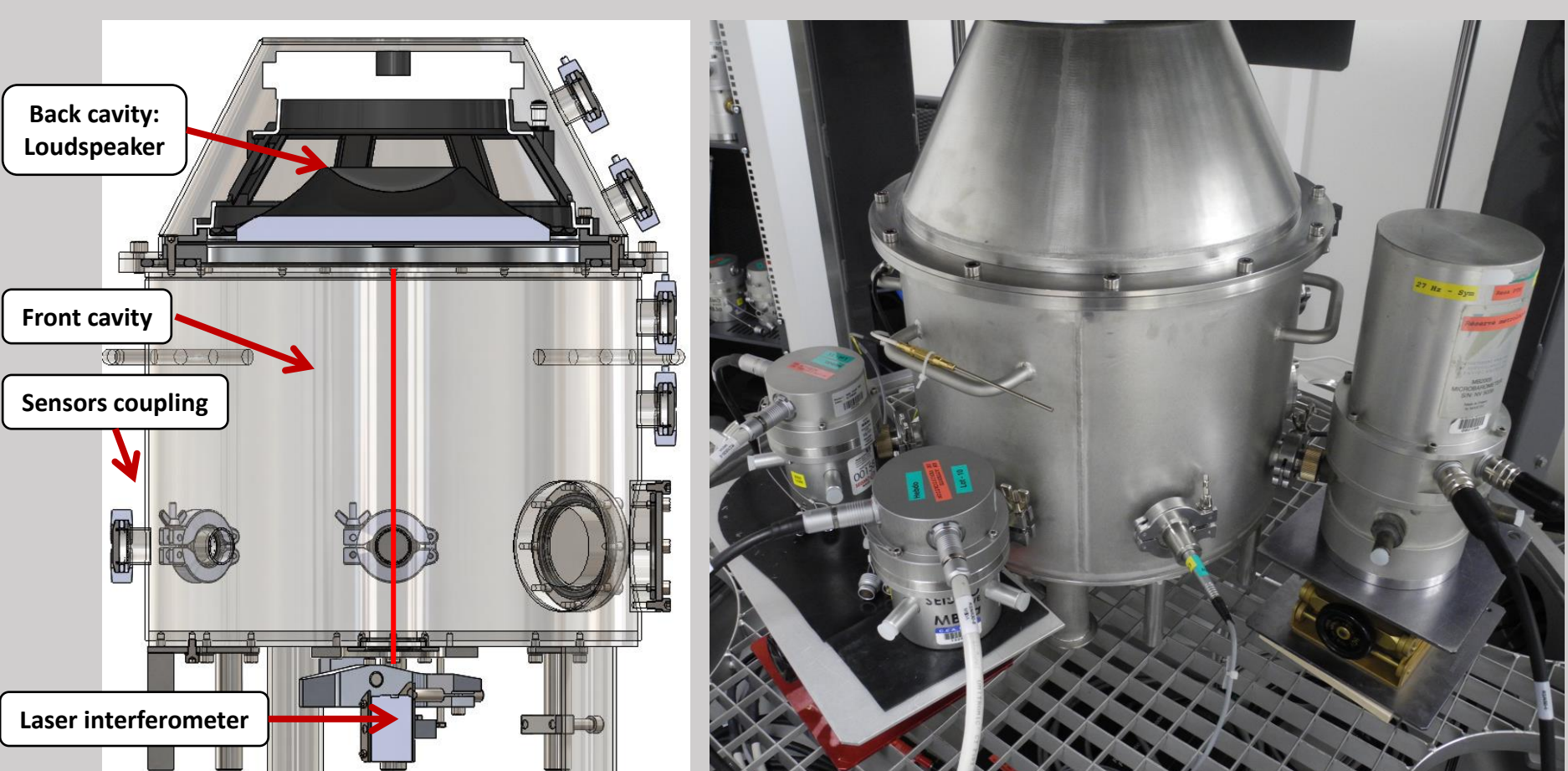


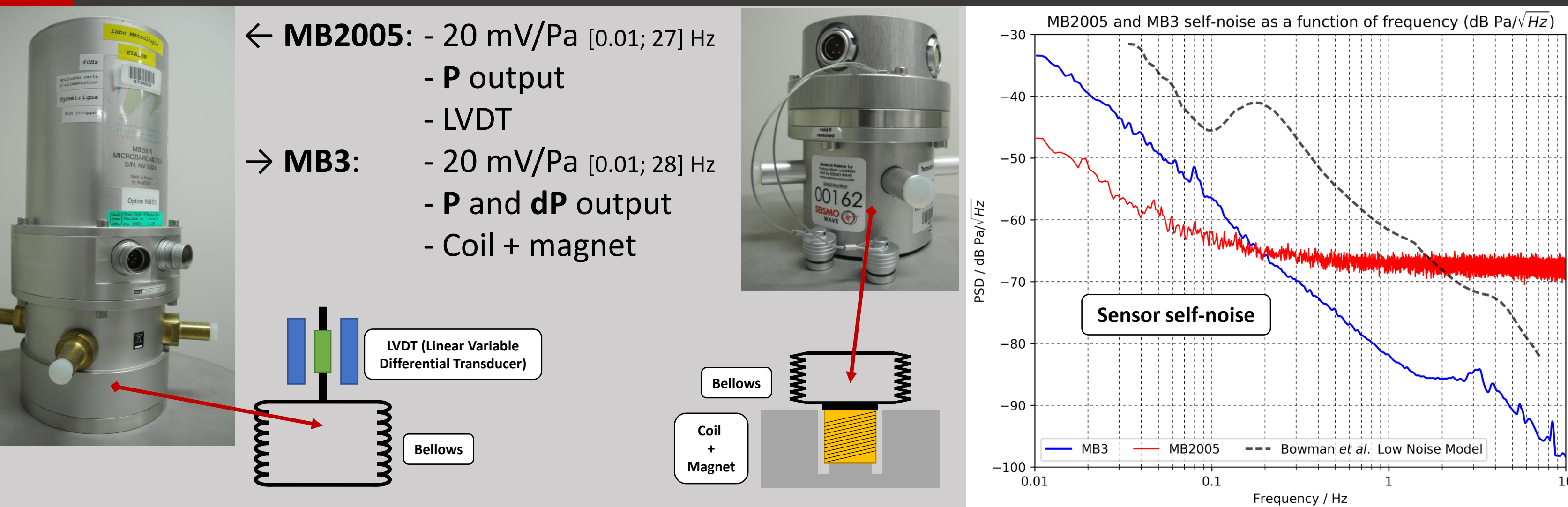


## 1 Confidence in measurement

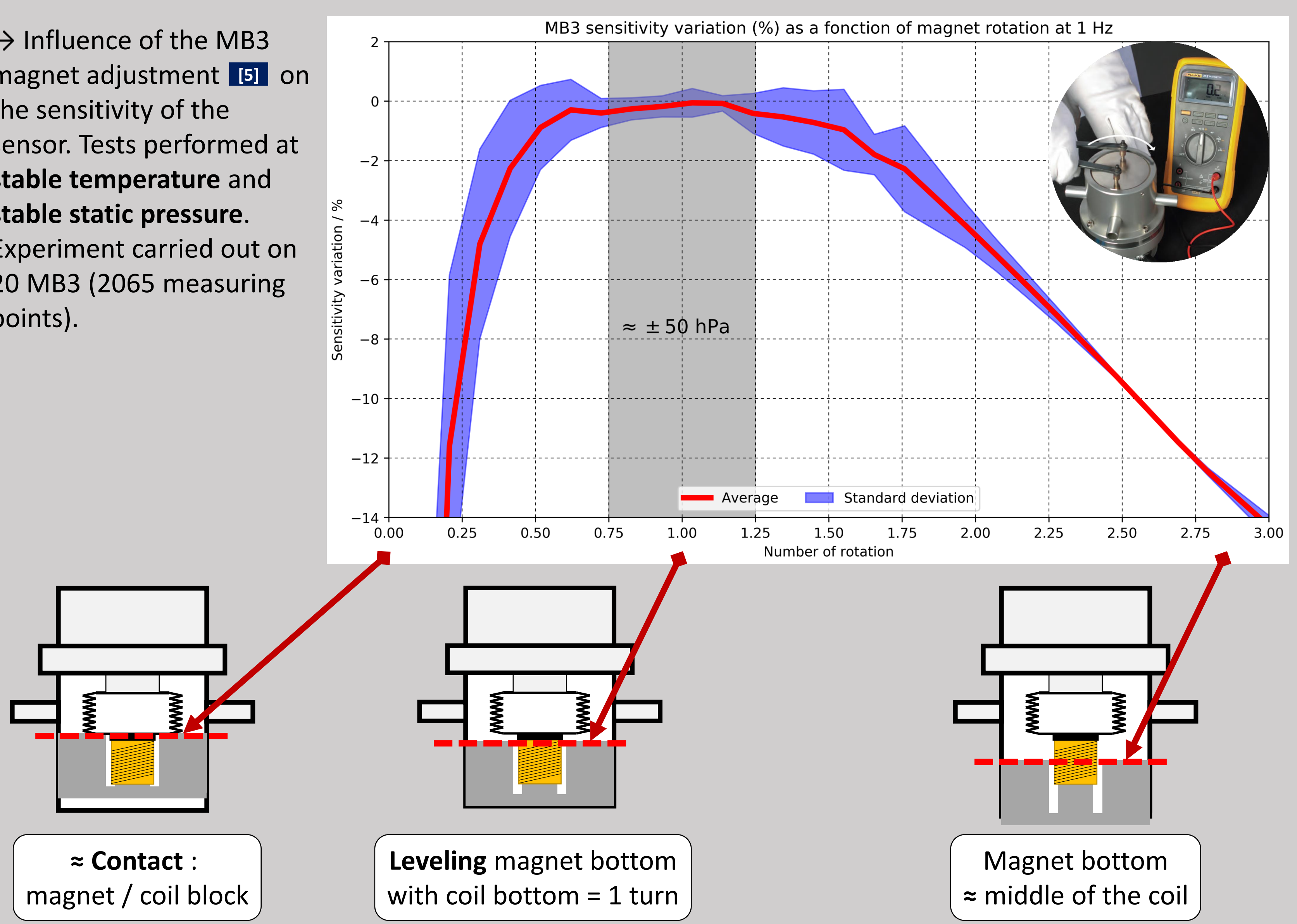
- [1] Poster SnT 2019 T3.1-P36 (Franck LARSONNIER)
- [2] P. VINCENT *et al.*, Acoustic transfer admittance of cylindrical cavities in infrasonic frequency range. *Metrologia*, 56(1):015003, 2019
- [3] P. VINCENT *et al.*, Analytical modelling and characterisation of an infrasound generator in the air. *Applied Acoustics*, 148, p. 476-483, 2019
- [4] P. VINCENT, Développement d'un étalon de pression acoustique et d'une méthode d'étalonnage de référence associée pour l'étalonnage de capteurs infrasonores à 1 Hz, *PhD. Thesis*, 2018
- [5] MB3 User Guide, rev. 2019



## 2 Microbarometers: MB2005 and MB3

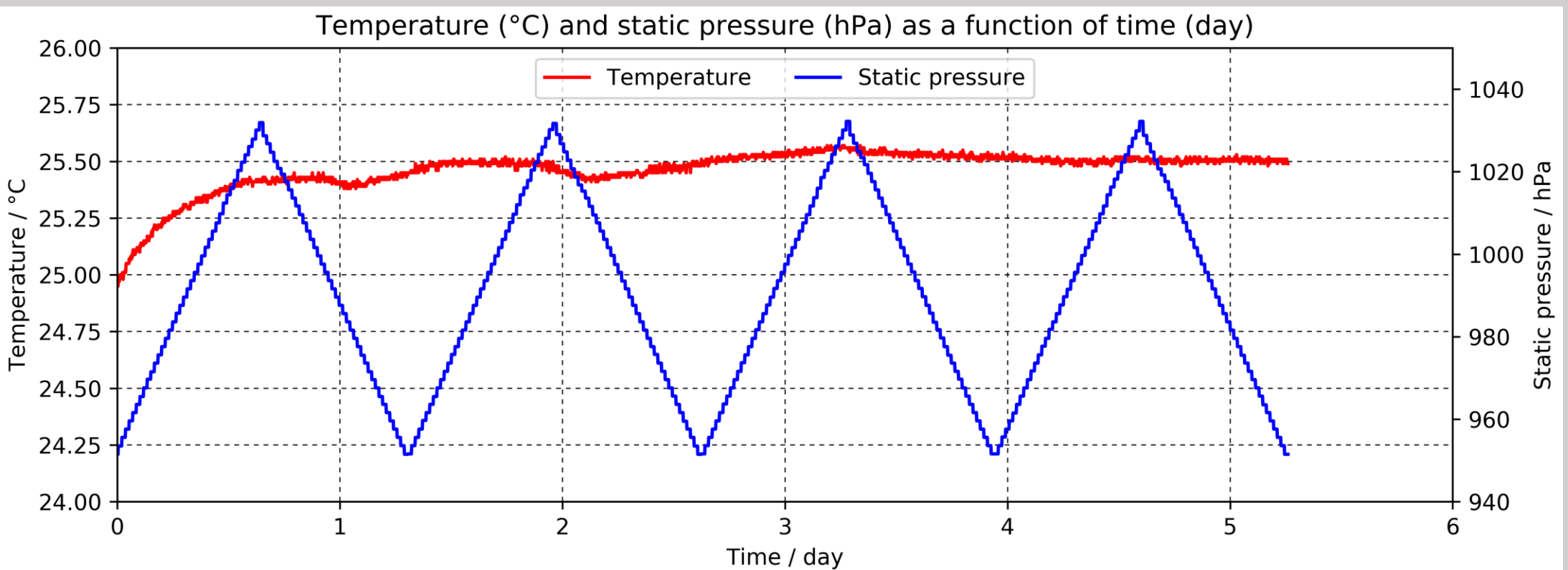


## 3 MB3 magnet adjustment sensitivity

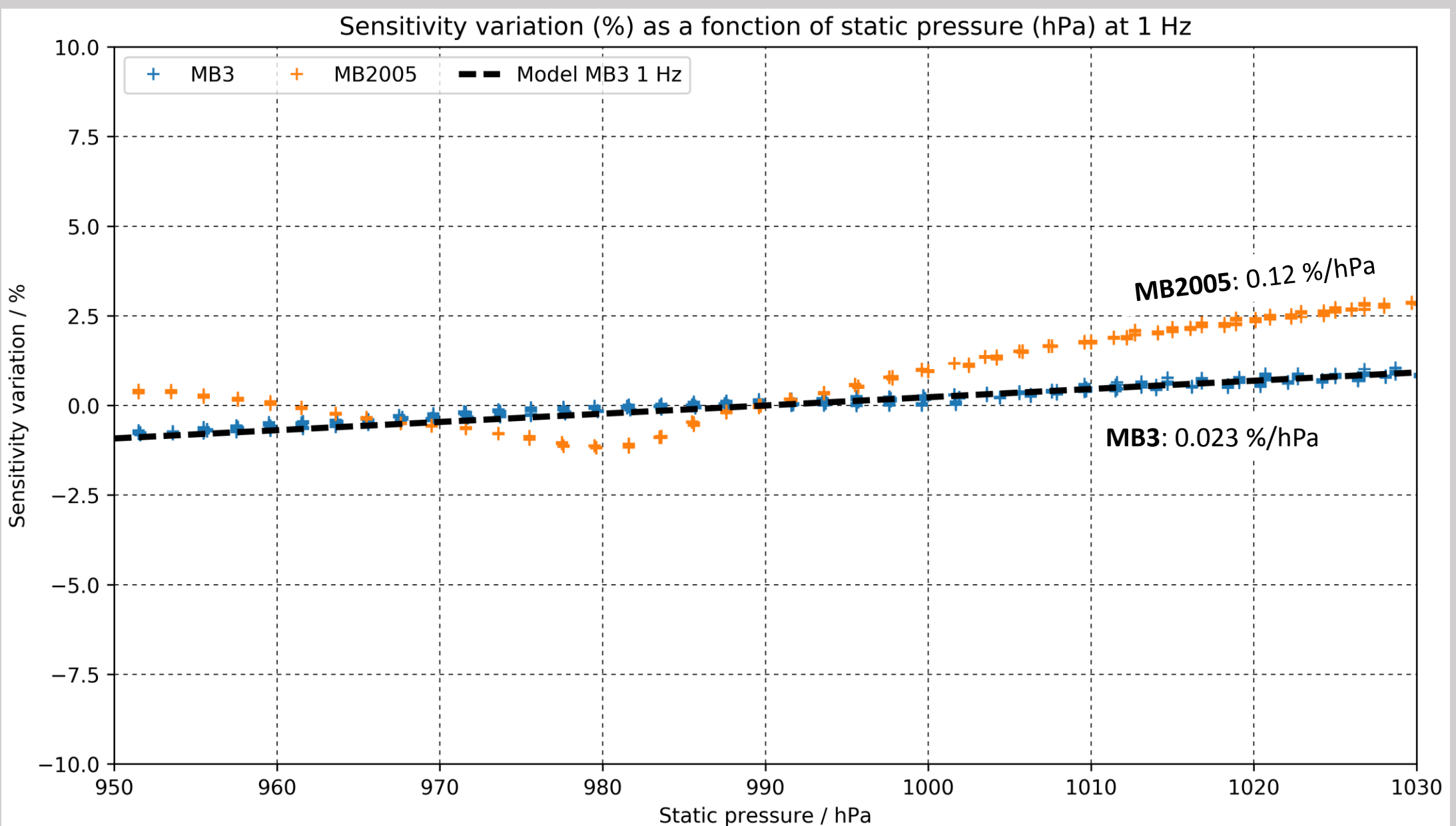


## 4 Static pressure sensitivity

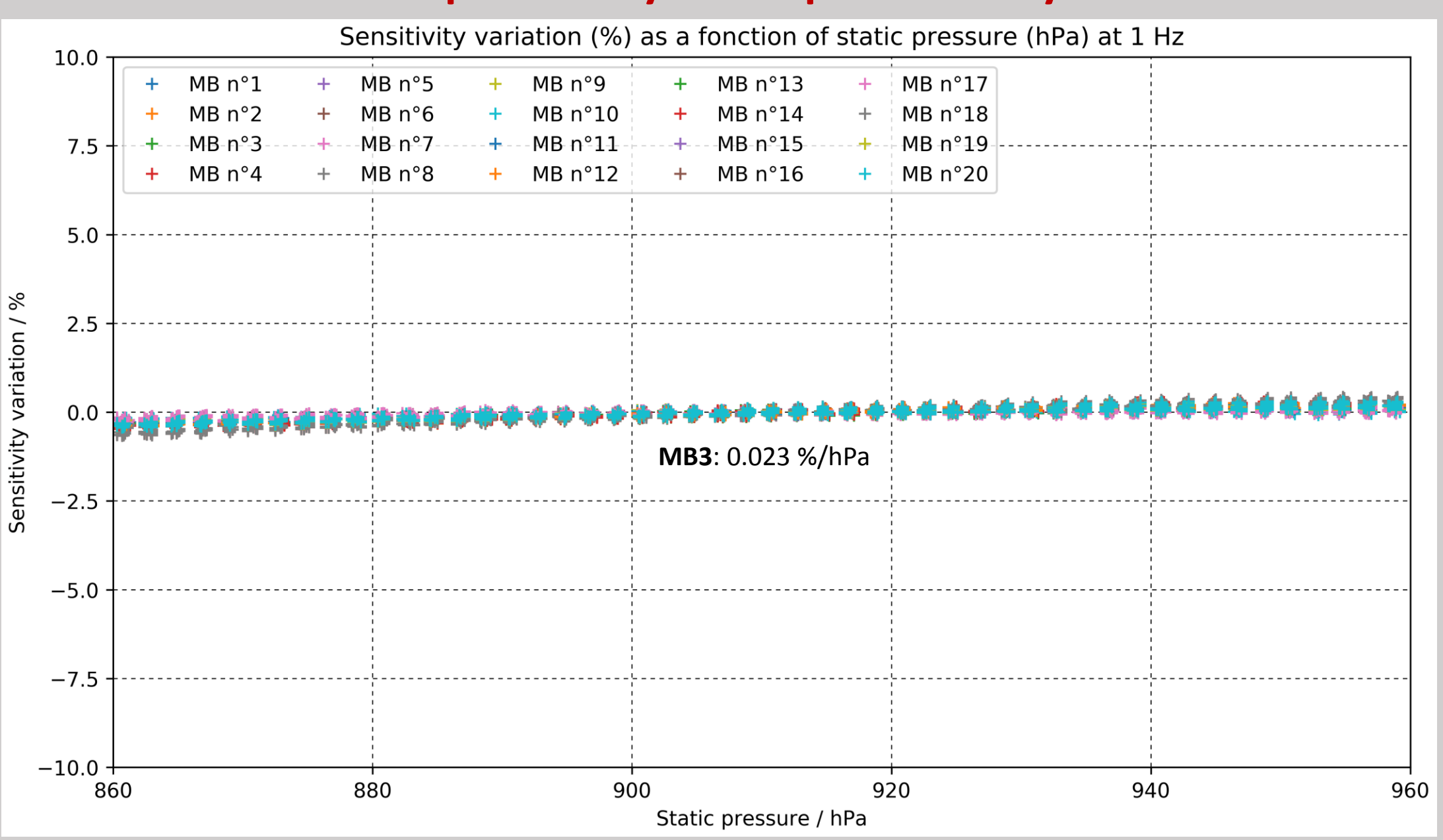
→ Static pressure variations (2 hPa steps) are generated by a **pressure chamber** from 600 hPa to 1100 hPa. The dynamic pressure is generated by an **IDPG** [2] [4] (Infrasound Dynamic Pressure Generator) located inside the pressure chamber. This IDPG is a pistonphone; the traceability to **SI** is ensured by a laser interferometer.



↑ **Static pressure** measured inside the microbarometers. Each step is stable at ±0.1 hPa. The **temperature** is stable inside the chamber during the experiment at ±0.3 °C.

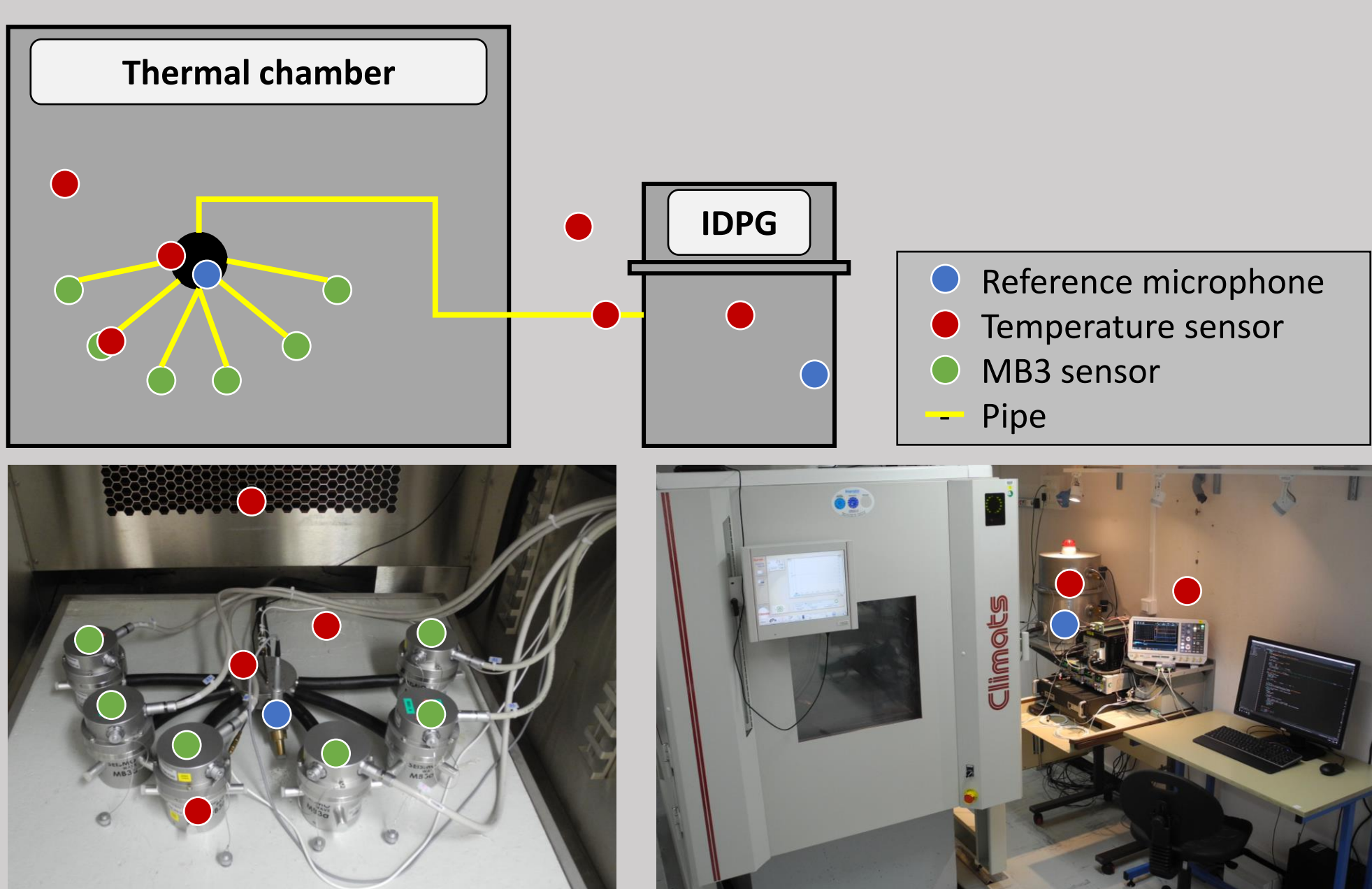


↑ Sensitivity variation with static pressure for sensors MB2005 and MB3 at 1 Hz. These results highlight the technological differences used in these two sensors. ↓ **Measurements performed on more than 20 MB3 with excellent repeatability and reproducibility.**

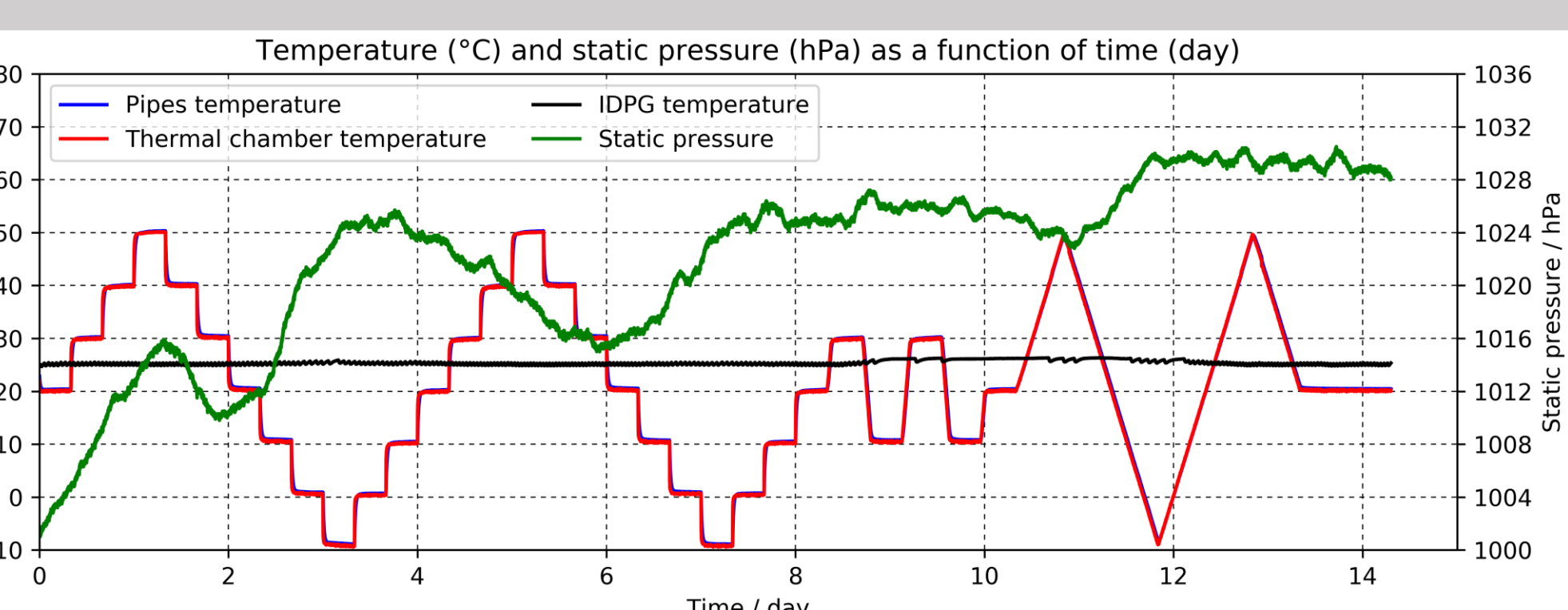


## 5 Temperature sensitivity

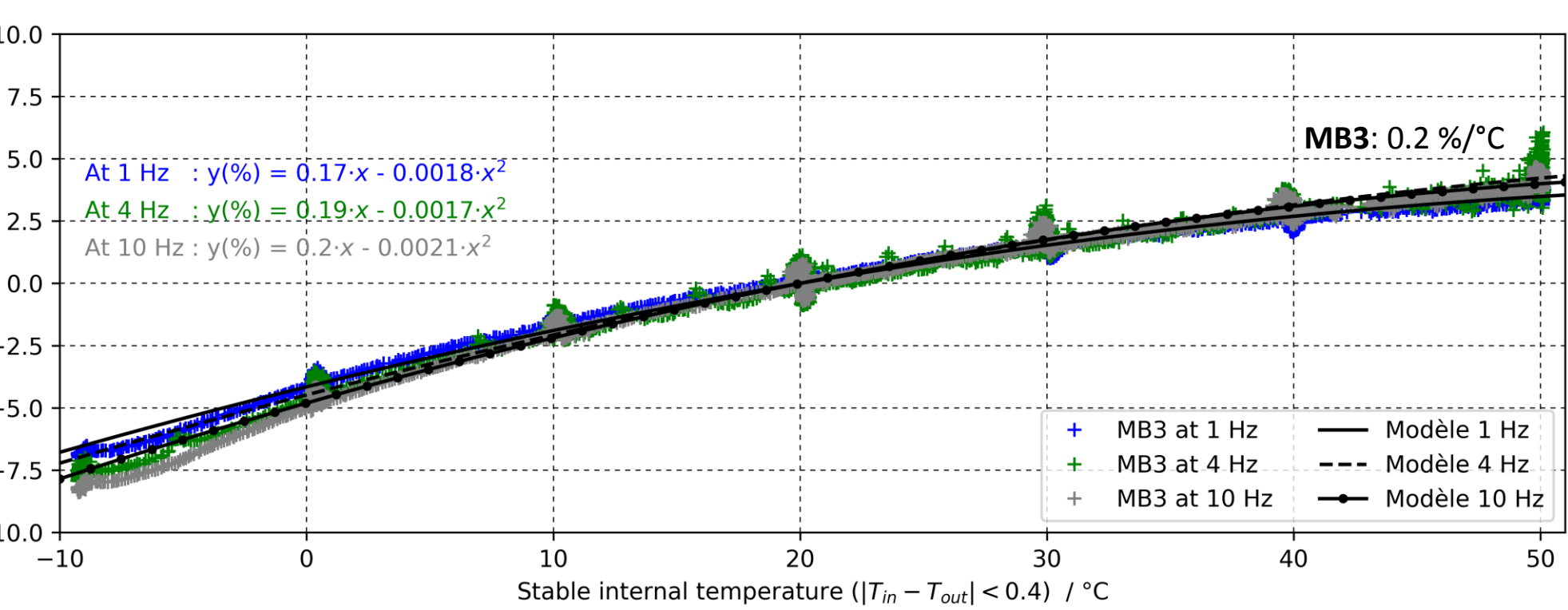
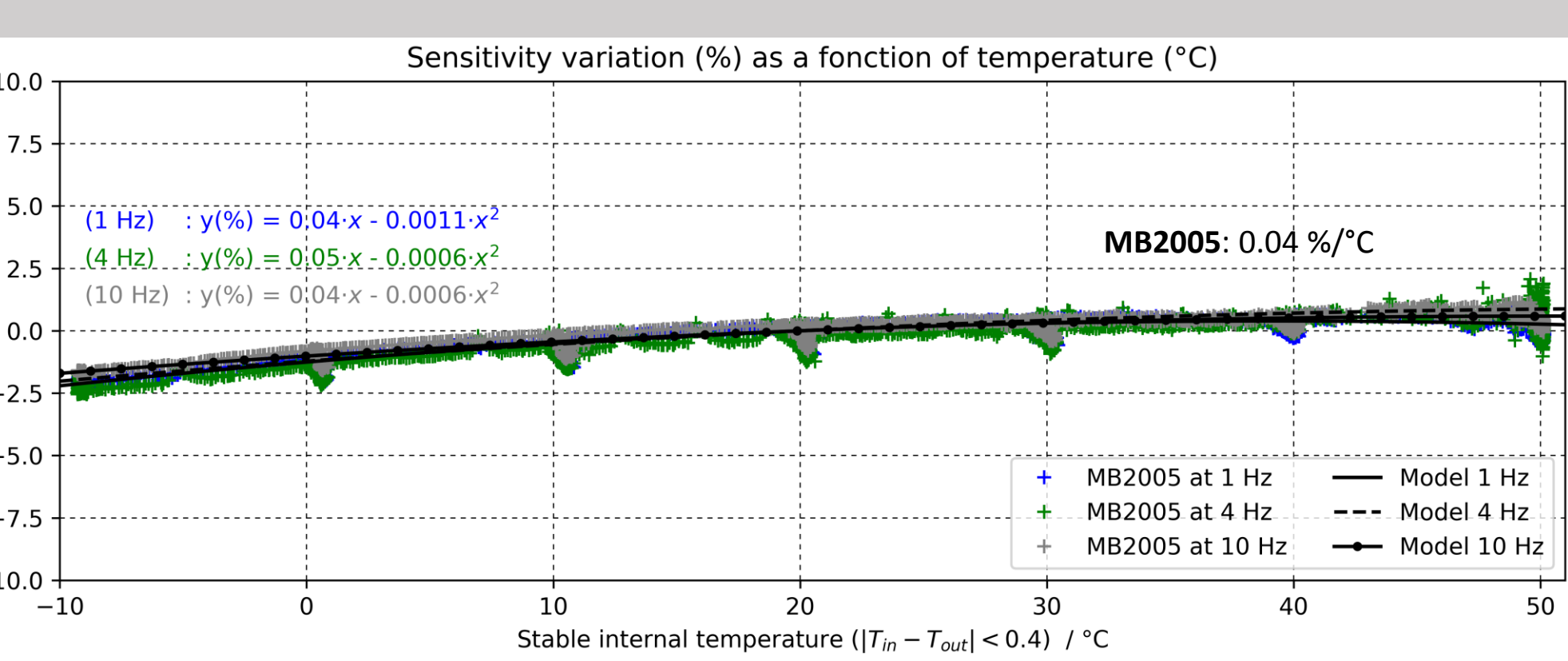
→ Temperature variations (ramps and steps) are generated by a **thermal chamber** from -10 °C to 50 °C. The dynamic pressure is generated by an **IDPG** [3] (Infrasound Dynamic Pressure Generator) located outside the thermal chamber and coupled to the sensors with a manifold and pipes.



→ Temperature measured in the thermal chamber, in the IDPG and **inside the sensor** as a function of time. The **atmospheric pressure** is measured to correct the sensitivity of the sensors using the tests 4.



→ Sensitivity variation as a function of **internal temperature** for MB2005 and MB3 microbarometers: these measurements are carried out in a thermal chamber for 14 days. The presented results are obtained after waiting for a **stable temperature**. The static pressure inside the pipes is **balanced** with the atmospheric pressure at each measuring point thanks to solenoid valves.



→ **Measurements performed on almost 30 MB3 from -10 °C to 50 °C, with excellent repeatability and reproducibility.** The second-order model adapts well to the measurements.

