METTI5 Tutorial T4 on
"In situ realization/characterization of temperature /heat flux sensors "

Authors

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Duration

1h30

Type

Experimental/methodological

Content

One will expect from a temperature sensor to be 1) sensitive to temperature, 2) accurate and 3) with low inertia. The sensitivity is provided by the thermometric phenomena. The accuracy comes on one hand from the calibration and measurement of the thermometric phenomena and on the other hand, from the correct mounting of the sensors. The first one is rather well known, the latter being very often ignored. The inertia of thermocouple is usually characterized by its time constant which depend also on the medium in which it is mounted.

This tutorial is about temperature and heat flux measurement with thermocouples and can be seen as a complementary information to lecture L5. Time constants, errors due to heat leakage through the connection wires of the thermocouples will be illustrated with experiments. Some rules will be explained to implement thermocouples in metallic sample in order to realize accurate and sensitive 1D heat flux sensors. Thin film heat flux sensors will also be discussed.