

ACCURATE SKIN & EAR TEMPERATURE SENSING FOR WEARABLE APPLICATIONS

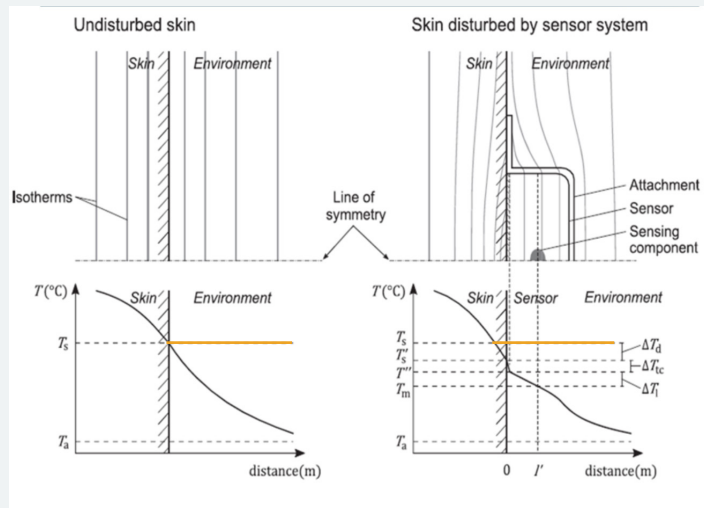
Continuous health monitoring is becoming part of our daily lives, from remote patient monitoring to wearable health-care devices for self-check and activity tracking. The 2020 health care crisis only accelerated this trend. Of course, the accuracy, reliability and repeatability of the data is crucial for a correct follow-up.

A study* has shown that skin temperature measurement using contact thermometry is facing systematic measurement variations.

In sharp contrast with contact thermometers, contactless infrared based thermometers inherently do not suffer from issues related to poor thermal contact quality.



Contact vs. contactless sensing



Study extract*:

Results: ...Results from these studies indicated minor (<0.5 °C) to practically meaningful (>0.5 °C) measurement bias within the subgroups of attachment type, applied pressure, environmental conditions, and sensor type. The 95% LoA were often within 1.0 °C for in vivo studies and 0.5 °C for physical models. ...

Conclusions: Setup variables and conditions of use can influence the measured temperature from contact Tskin sensors and thus key setup variables need to be appropriately considered and consistently reported.

— Contactless sensing with MLX90632

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Technology comparison	Contact temperature sensing	Contactless temperature sensing (MLX90632 - far infrared device)
Size	Multiple sizes, such as 2 x 2 x 0.75 mm	3 x 3 x 1 mm Smallest SMD medical-grade solution on the market
Power consumption	Typically 100 μ W (continuous measurement)	Typically 60 μ W (1 measurement per minute)
Accuracy (in theory)	+/- 0.1 $^{\circ}$ C (30-50 $^{\circ}$ C)	+/- 0.2 $^{\circ}$ C (30-39 $^{\circ}$ C)
Accuracy (in wearable)	Depends on variables and conditions of use (thermal contact and environment) * see study	Accurate and repeatable



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