

DERMOLOCKIN

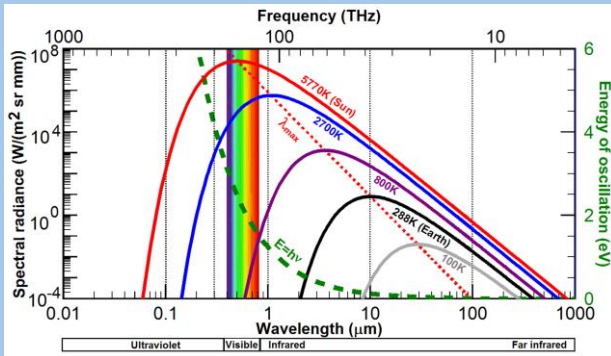
On the potential of active thermal imaging for skin cancer diagnostic

Mathias Bonmarin, Bruno Schmid, Lorenz Holzer and Beat Münch

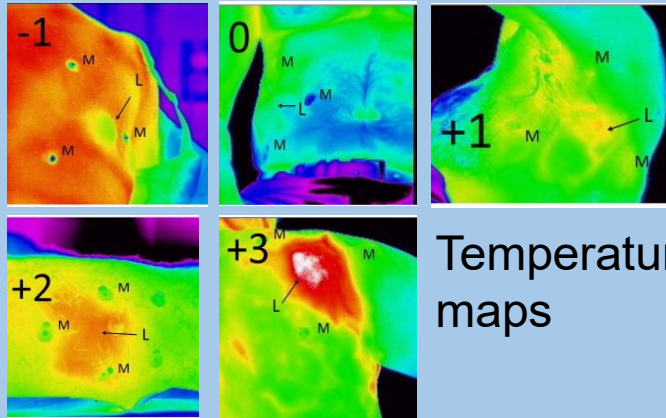
25. Deutscher Hautkrebskongress
10. – 12. September 2015 in Munich

What is active thermal imaging?

Thermal imaging



Measuring and imaging the thermal radiation emitted from every object.



Temperature maps

(Shada et al., *Journal of Surgical Research*, 182:1, 2012)

Dramatic technology improvements

1980 (100 k€)

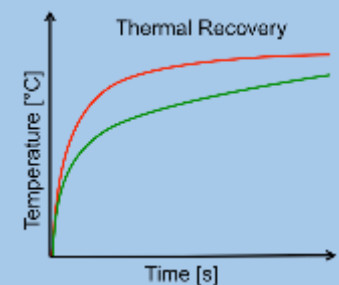
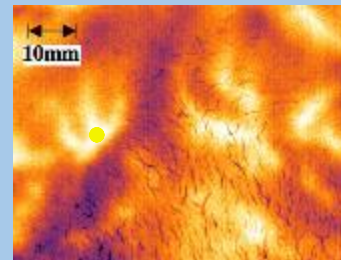


2015 (200 €)



Current resolution $0.017^\circ C$
VGA Image 640 x 480 pixels

Active thermography



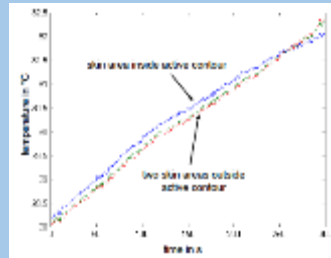
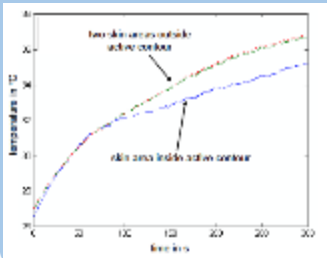
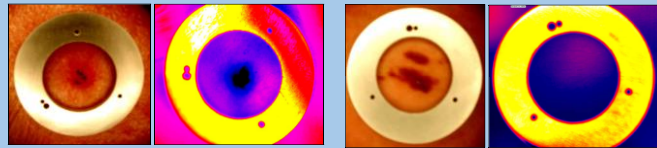
Disturbing subcutaneous thermal signals!

Monitoring the thermal recovery allows to "switch off" subcutaneous signals

Preliminary clinical evidence

Buzug & Reinhold

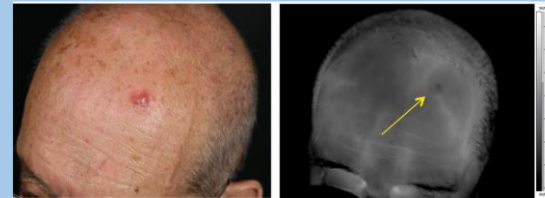
Basaliom Dysplastic naevus



Buzug et al. (2006) IEEE EMBS Conference, NYC USA.

Di Carlo

melanoma, BSC vs. AK

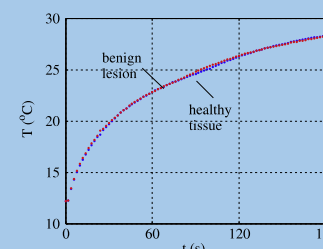
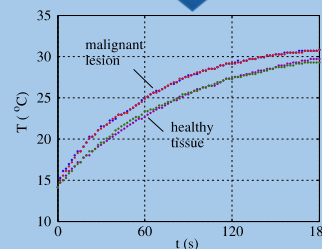
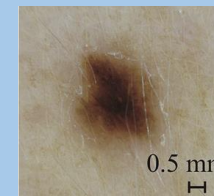
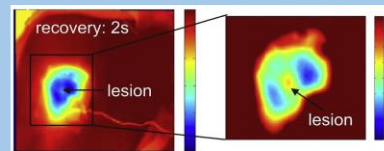


Di Carlo (1995) Clinics in Dermatology 13:329-336.

Di Carlo et al. (2014) Dermatologic Therapy 27:290-297.

Çetingül & Herman

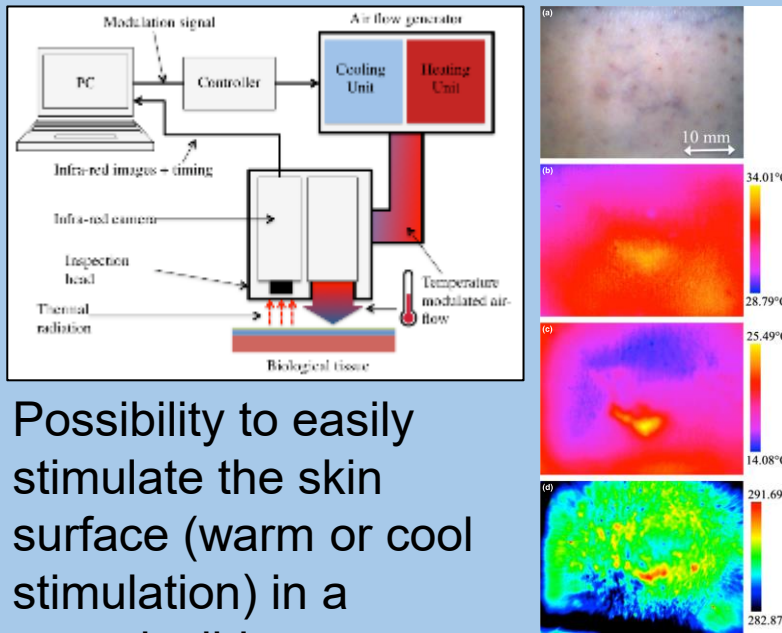
Melanoma



Çetingül & Herman (2013) Expert Review of Dermatology 2:177-184

Our technology

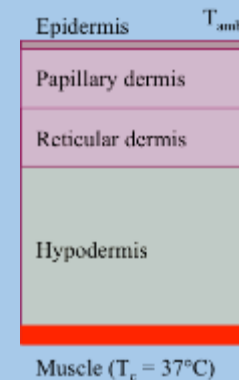
State-of-the art setup



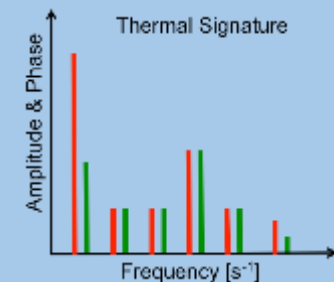
Possibility to easily stimulate the skin surface (warm or cool stimulation) in a reproducible way. No contact with the skin is required.

(Bonmarin & Le Gal, *Skin Research and Technology*, 21, 2015)

Thermal modeling and image processing capabilities



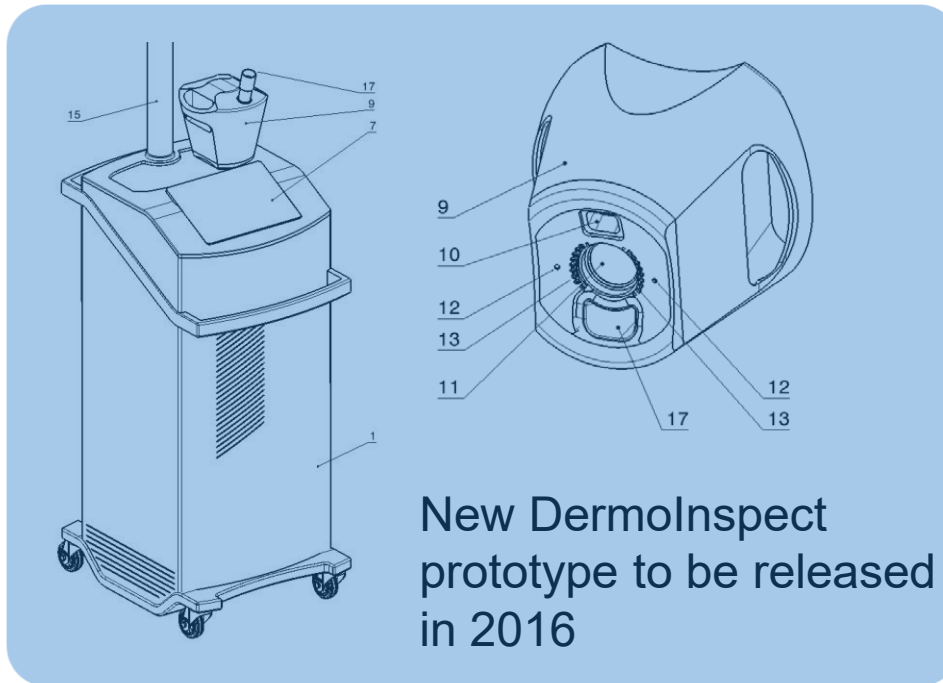
3D numerical model to simulate the heat transfer processes happening between the different skin layers.



Specific image processing tools to analyze the IR videos

(Bonmarin & Le Gal, *Computers in Biology and Medicine*, 47:1, 2014)

- **Prototype finalization (software, packaging, CE marking) in 2016.**



DERMOLOCKIN

Visit our website:

www.dermolockin.com

or contact us at:

info@dermolockin.com

- **We need to acquire more data to tune the device parameters.**
- **We are looking for clinical partners to help us further develop our technology.**