

Flexible Intelligent Nearfield Sensing Skins

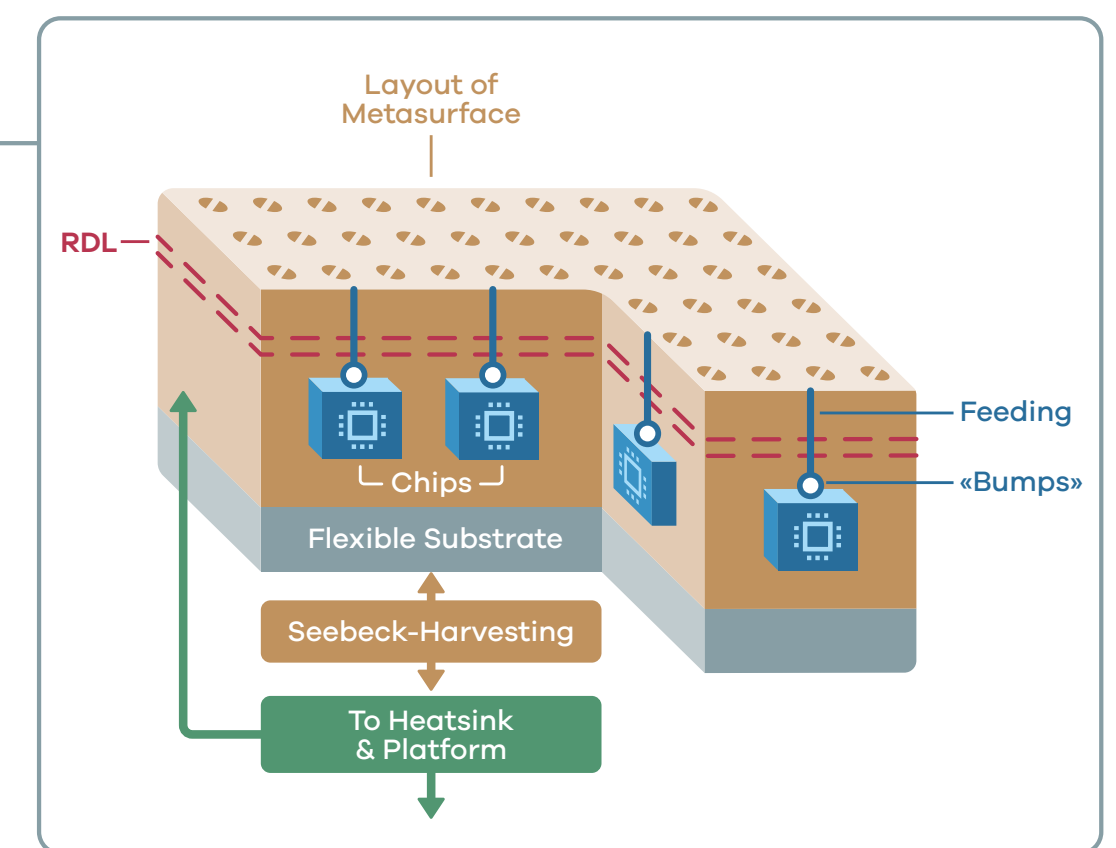
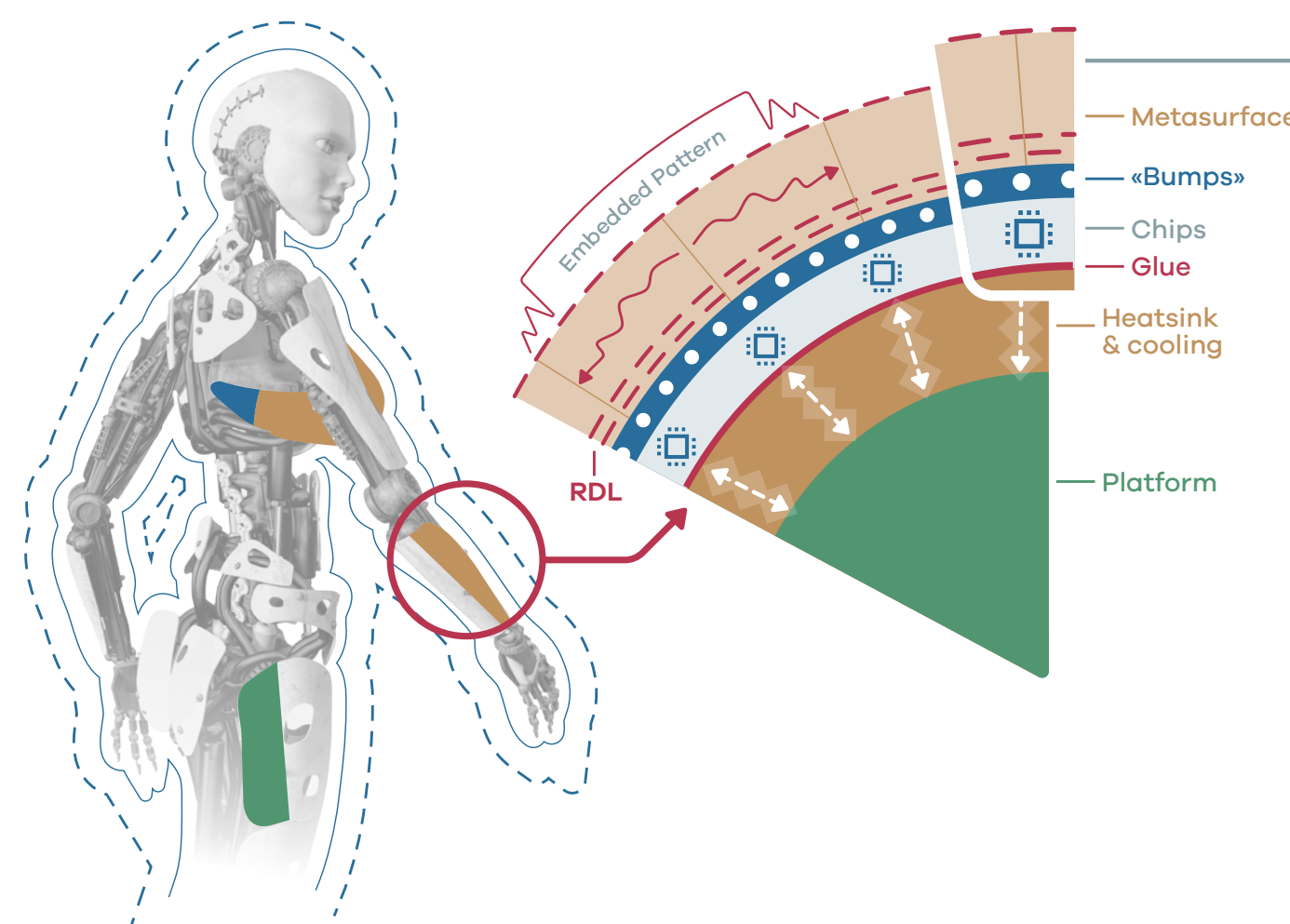
Realizing smart flexible surfaces with sparse electronics, using **advanced electromagnetic metasurfaces**, with sensitivity that decreases with distance from the surface.



CONCEPT

The proposed science to technology breakthrough is **an adaptive skin of a few millimeter thickness**, with unprecedented near-field sensing capabilities. The skin is based on the capability of metasurfaces to manipulate reactive fields.

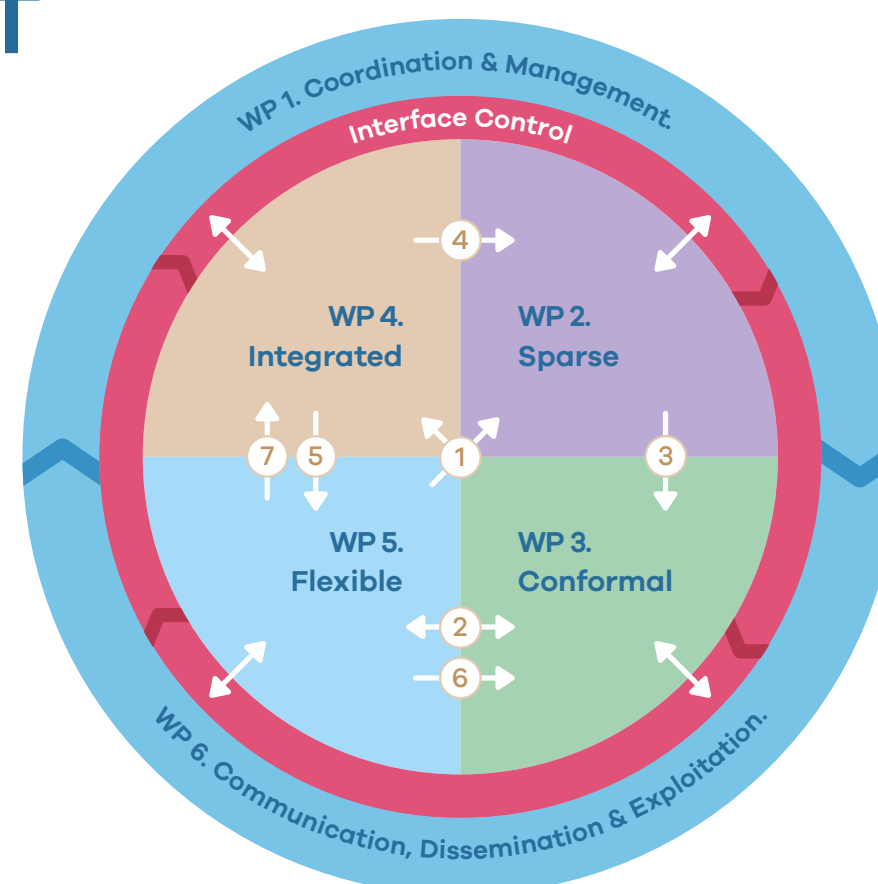
Signal analysis is then expected **to provide a translation from the near-field to far-field environments**, with near-field awareness down to 1 centimeter accuracy. Full coverage with a smart skin will produce a sensing "aura" around the robot or body.



AN INTERDISCIPLINARY PROJECT BY NATURE

FITNESS involves researchers in the fields of **microwaves, materials, electronics, chemistry, electromagnetic waves, etc.** The interactions are numerous and **interface control will be key** toward prototypes of new metasurfaces which will be sparse, conformal, flexible and which will also integrate the electronics, to be applied in the field of robotics.

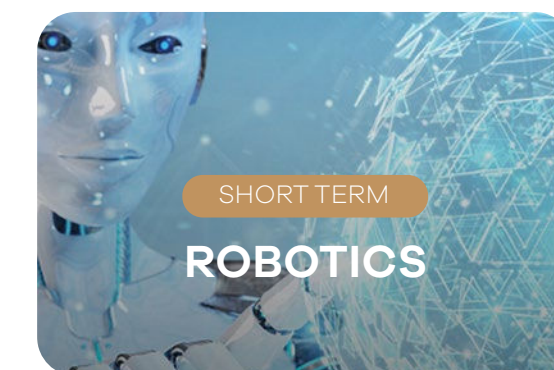
- ① Fabrication interfacing electronics and antennas
- ② Flexible curved MTS
- ③ Curved MTS inheriting from planar one
- ④ Correlation analysis
- ⑤ Heat management
- ⑥ Low-loss block copolymer
- ⑦ Metallization of flexible substrates



LONG TERM VISION

Redefining the sense of 'touch' of devices with **ultra low-power smart skins**, leading to a transformation in **safe and efficient human-device interaction** that transcends physical limits.

APPLICATIONS



Project acronym & title

FITNESS
Flexible Intelligent NEar-field
Sensing Skins



GA Number
101098996



7 partners



4 EU countries



Project Coordination
Université catholique de Louvain (BE)



EU requested contribution
3,6 M€



Starting date
01/04/2023



Duration
48 months

CONSORTIUM

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