

## COMPLIANT ON-SKIN COMPASS FOR ARTIFICIAL MAGNETOCEPTION

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Flexible electronics has inspired novel concepts like electronic skins [1] equipped with e.g. pressure and temperature sensing capabilities, which could replicate the 5 empirical senses of humans. Very recently, magnetosensitive skins enabled by shapeable magnetoelectronics [2] were reported providing humans with perception of magnetic fields, which is beyond the senses developed during the evolution.

Here, we present a technology platform to realize a functional on-skin compass system. The highly compliant compasses are prepared on 6- $\mu\text{m}$ -thick polymeric foils and rely on the anisotropic magnetoresistance effect. The response of these sensors is tailored to be linear and possess maximum sensitivity around the earth's magnetic field by using a barber pole configuration and Wheatstone bridge arrangement.

We envision that these on-skin compasses can enable humans to electronically emulate the magnetoceptive sense which some mammals possess naturally. This feat could open new possibilities to support research efforts on biomagnetic orientation and novel magnetic interactive devices. In the latter case, the applications span a plethora of tasks from virtual or augmented reality systems to touchless security systems and magnetic tags.

### REFERENCES:

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2. D. Makarov, M. Melzer, D. Karnaushenko, O. G. Schmidt. Shapeable Magnetoelectronics. *Appl. Phys. Rev.* **3**, 011101 (2016).