NFC technology for data transmission in wearables. Can graphene be the technological solution for flexible antennas?

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Printed electronics have opened a plethora of new opportunities in the world of wearables and point of care devices. These devices present two major challenges, how to transmit the data to the user and how to power the device. In this context, NFC technology can be the solution, not only transmitting the results to the user's smartphone but also powering our wearable device.

One of the main issues of the implementation of this technology on printed flexible devices is that antennas printed with silver nanoparticles-based ink (the most widespread commercial ink for inkjet printing) typically have a high electrical resistance. Consequently, these antennas have high losses and, in consequence, it is necessary to place the smartphone very close to the device.

In the case of environmental sensors, it is often necessary to obtain the information through a glass or acrylic wall; therefore, it is required to have a larger reading distance. Therefore, with the aim to face this issue, there are two possibilities: designing antennas with wider tracks (limiting the miniaturization of the device), or exploring new nanomaterials with higher electrical conductivity, giving the possibility to transmit at a greater distance.

In this work, we will evaluate and compare silver nanoparticles printed antennas with flexible antennas obtained from high conductivity sheets of graphene with a very simple and fast fabrication method.

References

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