

RECENT RESEARCH ACTIVITIES

Wireless power transfer R&D for smart, flexible, and accommodating society

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Our laboratory joins a JST Center of Innovation (COI) Project named ‘The Last 5X innovation R&D center for a Smart, Happy, and Resilient Society’ in Kyoto University from FY2013[1]. The Last 5X indicates that it is to achieve a cordless environment at home within 5 meters from a wall, outside monitoring within a distance from 50 meters to 5 kilometers, sharing information on a daily basis with family members and friends living far from you (up to 500 km) by using 5 technologies (electric power transmission, communication, sensing, device, ICT) that connect the 5 elements of people, information, energy, health, and the environment at the same time.

Our R&D team is developing various Wireless Power Transfer (WPT) systems for the aim of the COI (Fig.1). In 2017, we developed a wearable rectenna (rectifying antenna) to drive a wireless sensor by microwave wireless power, whose aim was a nursing and child care application[2]. A part of these works is supported by RISH mission 5-2. In parallel, toward a commercial WPT application, we proposed a special permission of a field WPT experiment to MIC(Ministry of Internal Affairs and Communications) and got it as ‘sandbox (special region)’ to carry out the field WPT experiment at Seikacho town hall, Kyoto. We also got a sandbox for a microwave charging system of an electro-mobility at the same place at the same time. After the field experiments at the sandbox, we will apply the WPT system as a commercial system in next step.

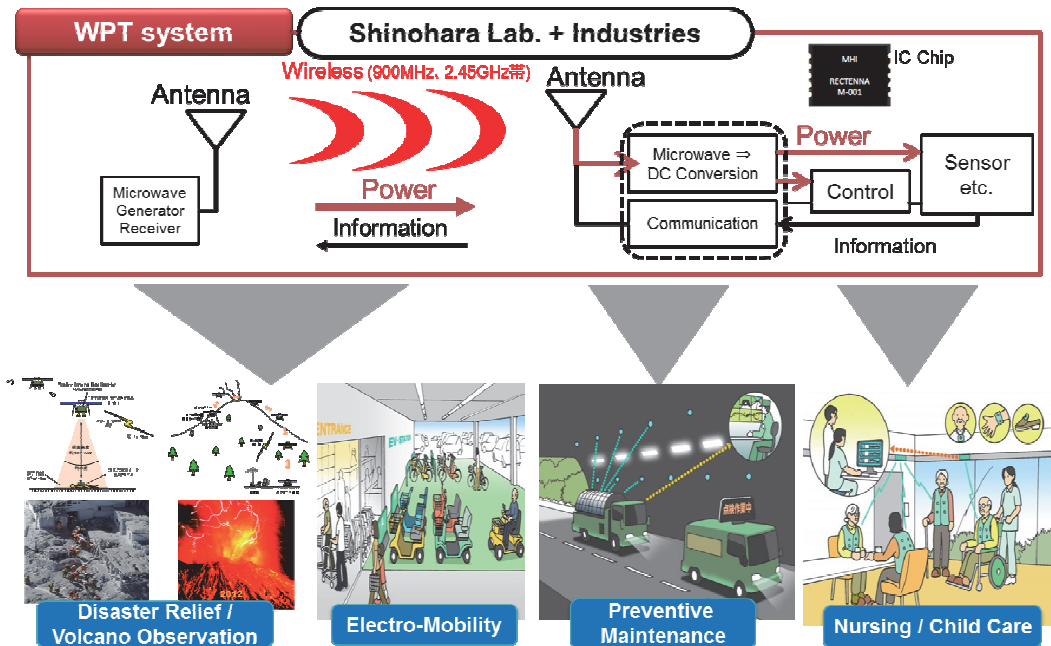


Fig. 1: Developing WPT systems and their applications by Shinohara Lab. and collaborative industries.

References

- [1] Kyoto University COI <http://www.coi.kyoto-u.ac.jp/en>
 [2] Y. Tanaka, et al., “Development of Wireless Sensor Powered by Microwave Wireless Power Transfer (in Japanese)”, submitting to IEICE Trans. B, 2018.