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1.Simultaneous Wireless Information and Power Transfer (SWIPT): Recent Advances and Future Challenges

2.Simultaneous Wireless Information and Power Transfer in Modern Communication Systems

Energy harvesting is a technology which can be used to capture and convert those energy that we don't want to use such as thermal energy, radiant energy and sound energy into electricity and put the converted energy into the work based on users' requirements. The energy source from the ambient environment is high-quality compared to the normal batteries and capacitors which is usually used in the normal EH model. However it is not quite effective as expected when the EH models uses natural sources since there is a lot of ambient sources that can not be predicted and most of them are quite unstable[1].

So WPT is one of the technologies which can be used in the EH model to solve the aforementioned issues where the nodes can be charged from the radiation of electromagnetic field[2]There are two types of WPT which are usually used in EH: near-field and far-field, they can be both used to harvest energy either from ambient environment and or base station. However, both of them have some drawbacks. For example, it is quite hard to maintain the field strengths with an appropriate level when using near-field WPT. And when using far-field WPT where far-field means long distance, the distance from users to base stations is an important which needs to be considered, since it is an important factor within communication networks.

3.Transporting Information and Energy Simultaneously

With the development of technology, the size of most of the wireless devices are becoming smaller and more energy efficient, and in the future, the radio waves will not only provide energy to operate these devices, they will also be unified in terms of transferring energy and information [2]. And Power-line communication(PLC) is one kind of technology which can carry power and information simultaneously using wired connections. However, it also has some technical drawbacks when it comes to energy efficiency and interference management. And that is the reason why SWIPT was introduced whose theoretical concept was first introduced in [3]. As its name indicates, SWIPT is a technology which can transfer information and energy simultaneously. SWIPT can be very useful when it comes to gain of spectral efficiency and interference management.