Rectenna Competition

～ Collecting more energy from radio waves ～

Technical Committee on Wireless Power Transmission (WPT) of IEICE Communications Society, is planning an RF-DC conversion efficiency contest of rectenna, a key component for wireless power transmission system. The contest is aimed to expand research interest and achieve continuous development in the wireless power transmission field. Students and young engineers are qualified to compete in the contest, and everybody is welcome to join the event.

- Organizer: Technical Committee on Wireless Power Transmission of IEICE
- Cosponsor: Technical Committees on Antennas and Propagation, Microwaves and Ambient Intelligence and Sensor Networks in IEICE,
  IEEE AP-S Tokyo Chapter, IEEE MTT-S Japan Chapter,
  the Japan Institute of Power Electronics, Sub-committee of the URSI-C
- Time and Date: 10:00 ～ 17:00, September 12, 2017
- Place: Anechoic chamber, 1st floor of No.5 building, Tokyo City University
  https://www.tcu.ac.jp/campusmap/setagaya_campus.html
- Contestants: Individuals or teams.
- Entry deadline: 24:00 June 5 -25, 2017 (New submissions closed))
- Precautions on the day: Please bring your rectenna by yourself.
  (Organizer does not response to the delivery request from contestants.)
  You can make alternative rectennas and substitute them at the competition site.

Constraints of test rectenna:

- DC output power is calculated by measuring the voltage observed at the load of 1 kΩ which is provided by the organizer on site.

Requirements of antenna and rectifier circuit:

- Must be designed and made by yourself.
- Rectifier circuits should be passive.
- Output terminals (both plus and minus) of rectifier circuit must have a structure that allows easy connection with an IC clip.
- Your rectenna including the mechanical portion must fit into the cubic container of 20cmx20cmx20cm or be smaller as shown in Fig.1.
- Weight of rectenna must not exceed 1 kg.
- The information on RF impedance including the wiring of 1 kΩ lumped load provided by organizer will not be disclosed. Hence, the low-pass smooth filtering is recommended taking possible common mode generation into account in the rectified circuit, so that the output is not affected by the load reactance.
- Contestants should integrate connection part of the antenna and rectifier circuit.

Measuring condition:

- Rectenna shall be fixed on the stand provided in the anechoic chamber (height of the stand: 150cm). (The details are denoted in “layout of contest place and measurement condition”)
- In the 500MHz session, the log periodic antenna of USLP model19143 is utilized as the transmission antenna, whose transmission power is 8W. The distance between transmission and reception (your rectenna) is 3 m.
- In the 2.45GHz session, the log periodic antenna of SCHWARZBECK USL9143 is utilized as the transmission antenna, whose transmission power is 10W. The distance between transmission and reception (your rectenna) is 1 m.
- The output of DC voltage from your rectenna is connected to a 1 kΩ load which is set at the measurement room via IC clip and a metal pair cable. The measurement room is next to the anechoic chamber.
- The DC voltage at the load is observed by an oscilloscope and read out.
- IC clips, metal pair line, 1 kΩ load and oscilloscope are provided by the organizer.

Award ceremony

- The rectenna that outputs the highest DC electric power in each of 500MHz session and the 2.45GHz session will be awarded.
- In addition to the above prize, a special prize will be possibly awarded to a work of novel antenna/circuit topology or high prototyping technology.
- The winners are requested to do a presentation in the coming WPT conference.

Remarks:

- The details of rules are subject to change.

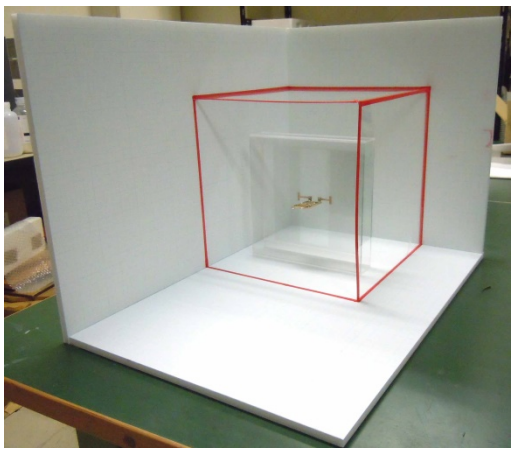

Fig. 1 Specified cubic container.

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