

Optical Wireless Power Transmission (OWPT)

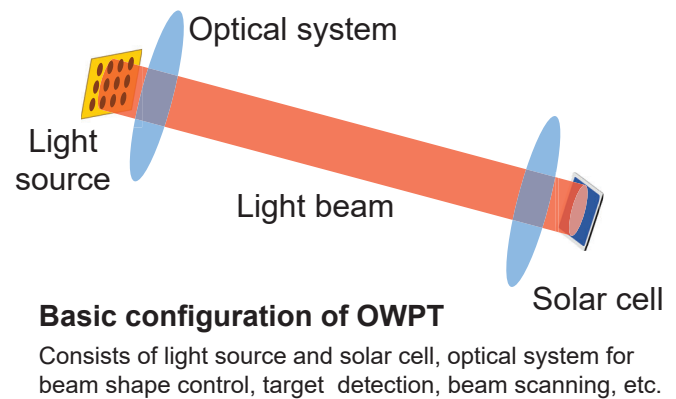
Photonics Integration System Research Center, FIRST

<http://vcSEL-www.pi.titech.ac.jp>

- Development of OWPT field
- Construction and characterization of OWPT systems
- Indoor, mobility, underwater, etc. applications
- Development of devices and modules for OWPT

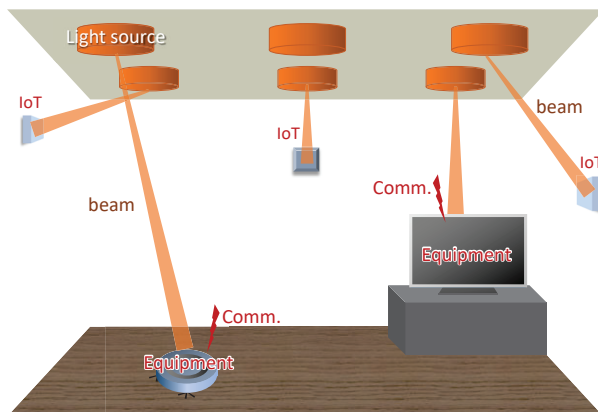
Innovation in equipment, applications, and services by OWPT!

After the transition to wireless communication, the transition to wireless power is expected to bring about a major change in society. Optical wireless power supply is promising because of its small size, long distance, and no electromagnetic interference. This method is at the stage where research and development has begun, and it is necessary to clarify the application area, necessary configuration, and problems. We are constructing systems and devices for the development of applications and social implementation of optical wireless power supply.



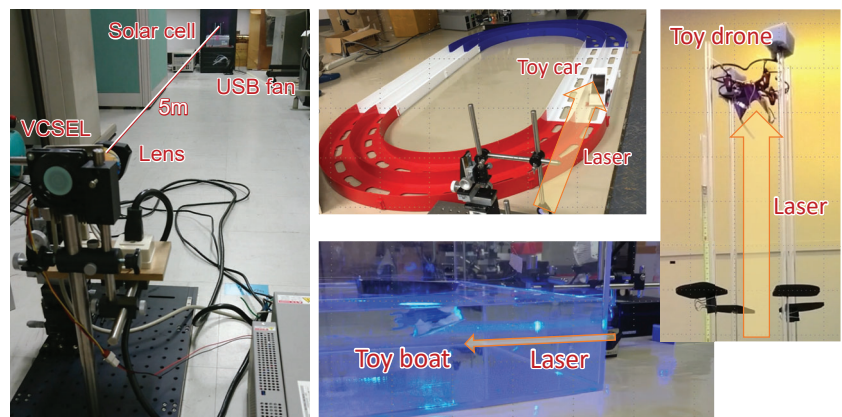
- **Simple system:** Light source, solar cell
- **Small size:** lightwave and semiconductor
- **Long distance:** up to km or more

- **High output:** up to kW or more
- **Simple circuit:** DC circuit and no EMI
- **Note:** laser safety and low efficiency



Schematic view of indoor OWPT system

- The goal is to apply not only to information equipment but also to all electric appliances and electric mobilities.
- Expanding the usage situations such as power supply to fixed equipment, power supply while moving.
- Advantages in system performance/function improvement, use in anytime/anywhere use, etc.



OWPT prototypes using VCSEL and LED

- Output power of 10 W to a distance of 5 m using a high power VCSEL array (> 20 W). High efficiency lasers and LEDs are important light sources for OWPT.
- We are investigating power supply for toy cars and drones, underwater equipment. Multiple light source systems, target recognition method, safety technology are under investigation.