Faculty of Science and Technology
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Thermal Design of Laser Beam Type Space Solar Power Systems

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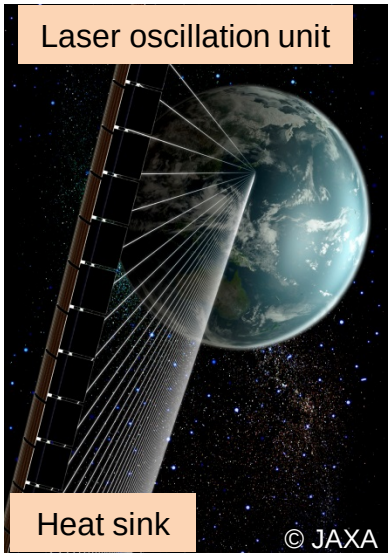

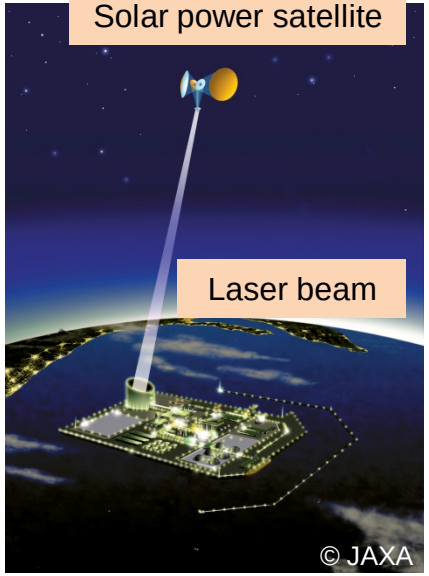

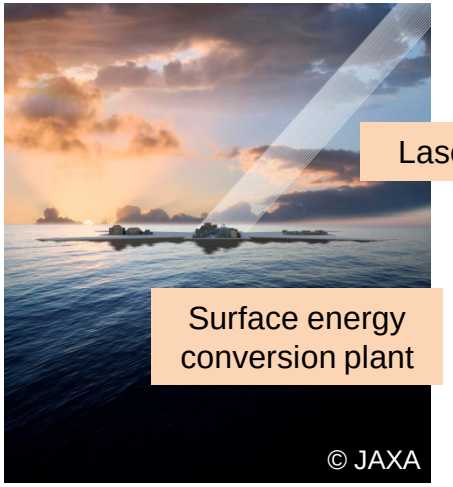

Content:

Space solar power system (SSPS) is the concept of stable power supply system, which collects solar power and generates electric energy in space for use on earth. Today, no prospect of actually using SSPS has yet emerged because of its technical challenges but practical use in near future is expected. In SSPS, two types of energy transmitting technique from solar-power satellite to Earth's surface are planned. One uses laser beam emitting, the other uses microwave wireless transmission. In particular in former system (Laser-beam type SSPS : L-SSPS), it is important that the cooling of laser diodes on space photovoltaic module and the design of beam collector on surface, which converts from high energy density laser beam to electric power.

Our purpose is to estimate and analyze the heat balance of PV/LD joint module, and design an optical heat sink dimension or the arrangement of individual device. Furthermore, new PV and solar thermal energy (STE) combined system for surface laser beam collector is being developed for high efficiency energy conversion.

Keywords: space based solar power,
radiative heat transfer,
PV/STE combined system

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