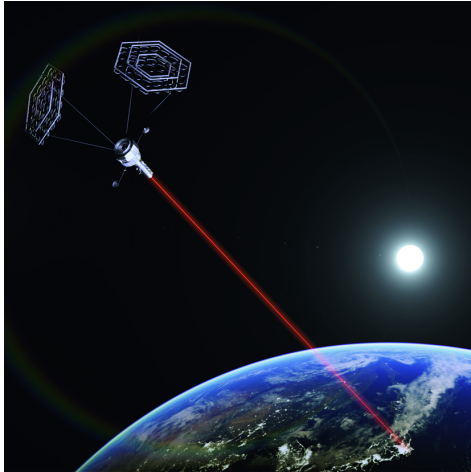


Space Solar Power Systems



Background

The concept is to collect solar energy in space and transmit it to the ground. Since the sun is almost always visible from geostationary orbit and there is no atmospheric attenuation, the amount of energy obtained at the space is about 10 times that on the Earth.

Summary

NTT researches solar-pumped laser, transmission beam, and high-intensity energy conversion technologies. We are successfully tested each of them, including 1 km 1 kW laser transmission, outdoor solar-pumped laser oscillation, and high-efficiency photovoltaic conversion prototypes.

Transmission Experiment at Oita

Successful 1km Transmission under Strong Atmospheric Turbulence

Receiver side



Partitions

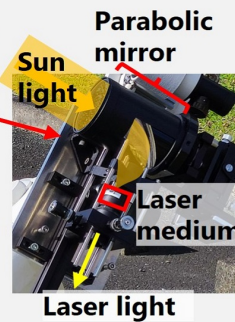
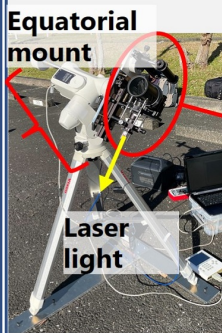
Transmitter side



※Photovoltaic

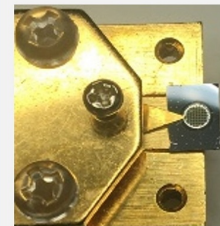
Solar-pumped Laser Oscillation Experiment

Solar Absorption and Lasing by Nd/Cr: YAG Single Crystal



Photovoltaic Device for Infrared Laser

27% Efficiency by Optimizing Semiconductor Composition and Electrode Structure



Measurement fixture

Close-up photograph



Features

- Successful 1km laser energy transmission by optical design utilizing the simulation considering atmospheric turbulence and construction of high-power optical system
- Outdoor solar lasing by lasing medium (Nd/Cr: YAG Single Crystal) oscillated only by sunlight
- 27% efficiency under 1060-nm-range laser irradiation by optimizing semiconductor composition and electrode structure

Future_benefits

It has the potential to realize a clean and sustainable energy supply while minimizing the impact on the global environment by utilizing the vast space.

Collaboration partners

Mitsubishi Heavy Industries, Ltd., The Graduate School for the Creation of New Photonics Industries, University of Miyazaki

Exhibiting Company

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