



Supplying power remotely to drones, HAPS, and disaster sites Long-range wireless laser power technology

Background and Technical Challenges

Laser-based wireless power transmission over distances beyond 1 km is promising for drones, HAPS, and disaster-site power supply, but practical use demands higher efficiency and stability.

電力を長距離伝送するワイヤレスレーザ技術

Long-range wireless laser power technology

目的 Purpose ドローン・HAPSの軽量化、災害地無線給電実現のためのレーザ無線給電技術確立
Establishment of wireless power transfer technology for drone and HAPS weight reduction and disaster-site power supply

展開イメージ Technology Development Image

エネルギー伝送に適したフラットなビーム整形
Forms a flat beam suitable for energy transmission

外周:リング状ビーム
Outer ring-shaped beam

中心:拡散ビーム
Center spread beam

回折光学素子 DOE

ビーム整形前
Before beam shaping

フラットビーム
Flat beam

ビーム整形前 Before beam shaping

ビーム整形後 After beam shaping

R&D Goals and Outcomes

We will establish laser-based technology for remotely supplying power to drones, HAPS, and disaster sites, with future applications on the Moon and space solar power systems.

Key Technologies

01 Core Technologies

A unique beam-shaping technology that optimally controls beam profile and phase to uniformly irradiate a receiver panel 1 km away.

02 Key Differentiators

This technology uses lasers for wireless power transfer, achieving high-efficiency, long-distance transmission beyond conventional methods by optimizing the beam profile with custom diffractive optical elements.

Use Cases Energy

R&D phase Business

Technology Schedule FY27-29

Commercialization Schedule FY30

【Exhibitors】

NTT Space Environment and Energy Laboratories

【Co-exhibitors】

Mitsubishi Heavy Industries, Ltd.

【Contact】

Space Environment and Energy Laboratories Planning Department

【Related Link】

<https://group.ntt/en/newsrelease/2025/09/17/250917a.html>