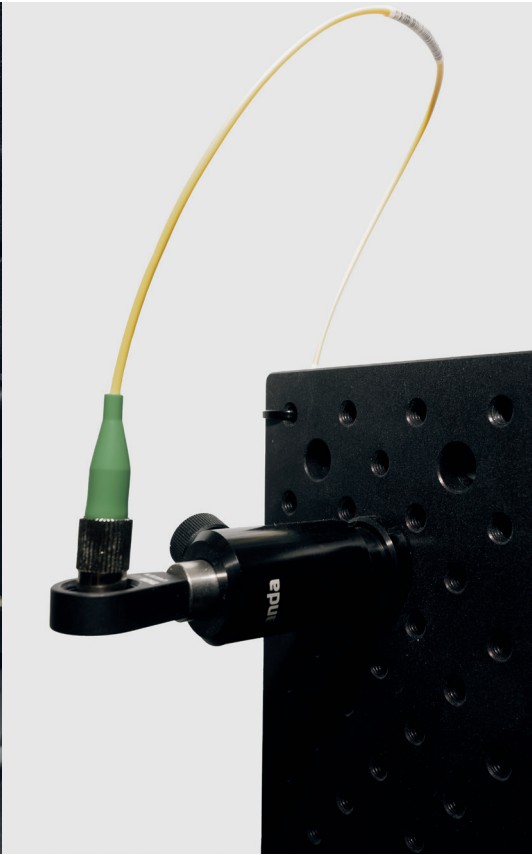# SATELLITE LINK SIMULATION FOR AEROSPACE

FRAUNHOFER AVIATION & SPACE

At Booth M22, Fraunhofer HHI joins forces with 30 Fraunhofer institutes to showcase advanced research and technologies tailored to aerospace applications. Based on our expertise in free-space optical (FSO) communication systems, we show a multi-aperture setup designed to improve satellite link resilience by compensating for atmospheric disturbances.

Visit us at Booth M22!

SPACE TECH EXPO
EUROPE

Live FSO System Demonstration

Our compact 50 cm model simulates a 1,000 km satellite link with bidirectional, real-time data transmission at 10 Gbit/s. This demonstration reveals the system's potential for stable, high-performance communication in aerospace applications through in-parallel data transmission of four spatially distributed channels in different wavelengths for the uplink.

Highlights

- **Simulated Long-Distance Link:** The compact model offers an insightful demonstration of the challenges and solutions for long-distance communication.

- **High Data Throughput:** With real-time transmission at 10 Gbit/s, the system meets the speed requirements of modern communication.

- **Atmospheric Disturbance Compensation:** The unique multi-aperture design maintains stable data links even under atmospheric turbulences, simulated with our model.

- **Adaptable And Scalable:** License-free optical spectrum and DWDM technology enable flexible data transmission, which integrates seamlessly into existing networks and user-specific architectures.
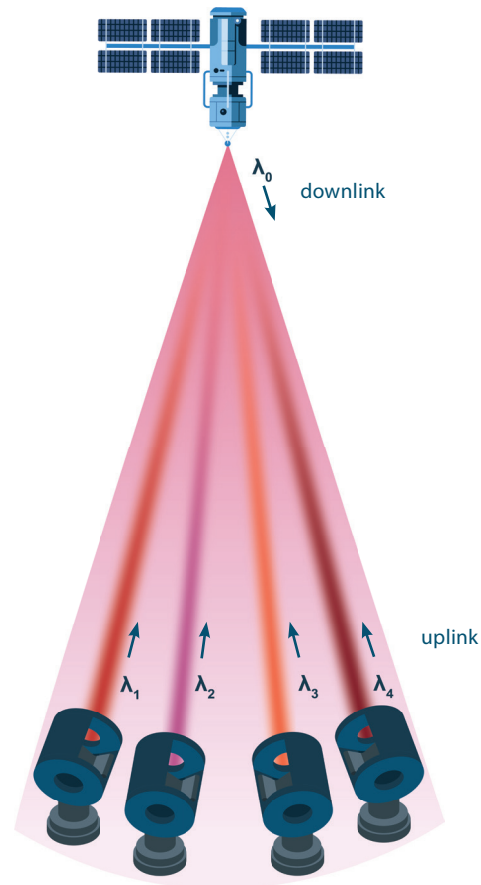
Applications

Fraunhofer HHI's optical antenna systems serve as over-the-air bridges for classical and quantum-based optical communication, ideal for:

- High-speed satellite-to-ground laser links

- High-speed terrestrial backhaul connections

- Quantum Key Distribution (QKD) for secure communication.

Dr.-Ing. Nicolas Perlot

Photonic Networks and Systems

Phone +49 30 31002-782 l -414
info-pn@hhi.fraunhofer.de

Fraunhofer Heinrich Hertz Institute
Einsteinufer 37, 10587 Berlin
Germany

www.hhi.fraunhofer.de/FSO