



OSIRIS - Overview

Deutsches Zentrum für Luft- und Raumfahrt e.V.
(German Aerospace Center, DLR)
Institute of Communications and Navigation
Digital Networks Section
Optical Communications Group

Introduction

- OSIRIS – Optical High Speed Infrared Link System
- **Goal: Develop experimental Laser sources for small LEO satellites**
- Development Activities started in 2007
- First Version of OSIRIS-Payload will be launched with DLR's TET-1 (Space-Qual. and Integration finished, Launch ~Mid 2011)
- Further Developments are ongoing

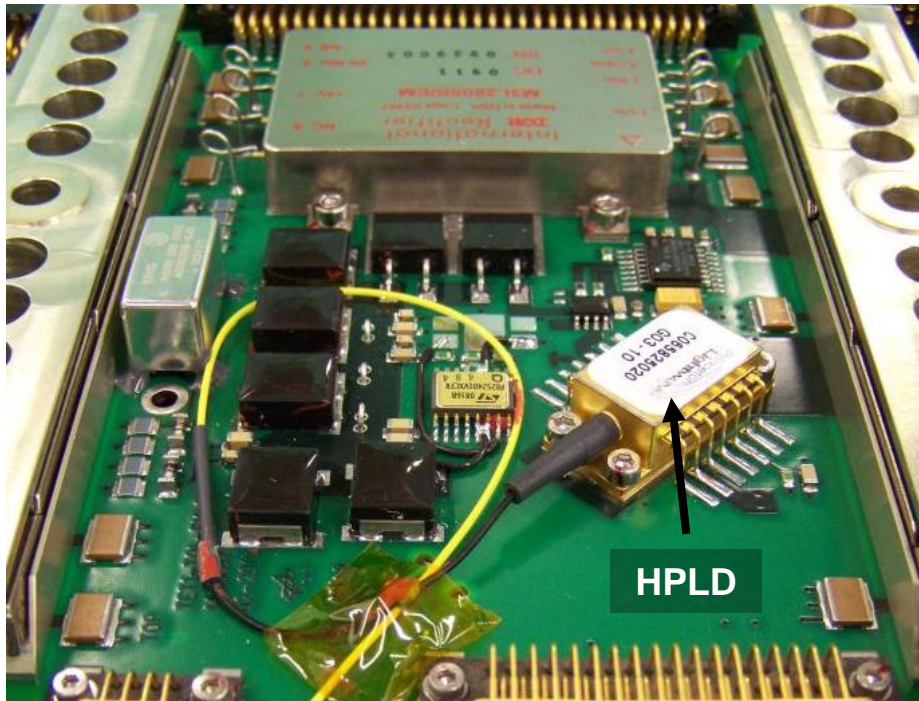
Project Goals

- **Main Goal: Get Test-Sources in Space for diverse technological tests and measurement campaigns like e.g. atmospheric transmission channel measurements, Optical Ground Station (OGS) performance assessment, robustness of data formats (FEC, protocols), atmospheric sounding, ...**
- Demonstration of an experimental high-rate data downlinks (1MBit/s ... >1.25GBit/s)
- Low-volume, low-power, low-weight terminal
- Target pointing is accomplished by satellite
- Demonstration of Ground Station Diversity-Concepts („GLONOS – Global Network of Optical Ground Stations“)

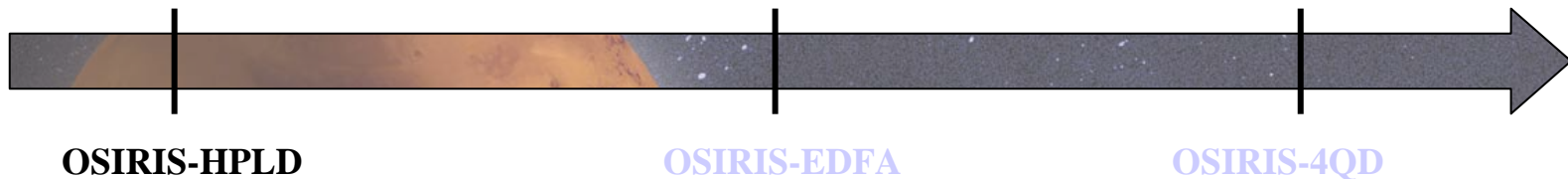


OSIRIS-Developments (1)

OSIRIS-HPLD



- High-Power Laser Diode
- Space Qualification finished
- In Conjunction with DLR Berlin
- Launch 2011
- ~150g, $P_{\text{Opt}}=115\text{mW}$ (mean)
- up to 20Mbit/s
(depending on Pointing Accuracy of Satellite)



OSIRIS-Developments (2)

OSIRIS-EDFA



- Erbium-Doped Fiber Amplifier
- Currently in Development
- Launch in 2012
(Flying Laptop, Univ. of Stuttgart)
- ~1kg, $P_{\text{Opt}}=1\text{W}$ (mean)
- up to 1,25Gbit/s
(depending on Pointing Accuracy of Satellite)

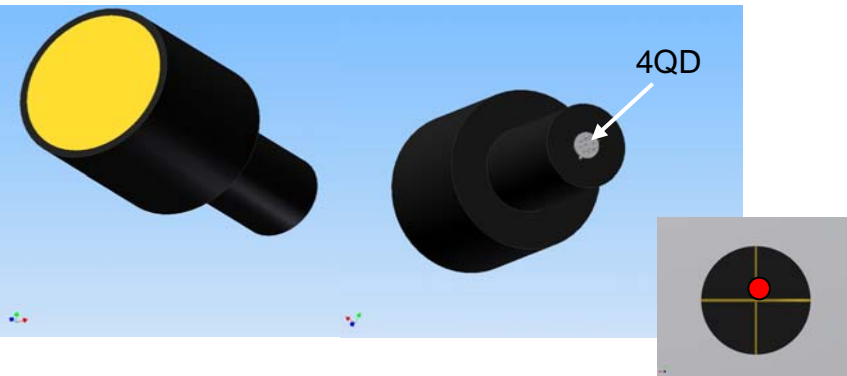


OSIRIS-Developments (3)

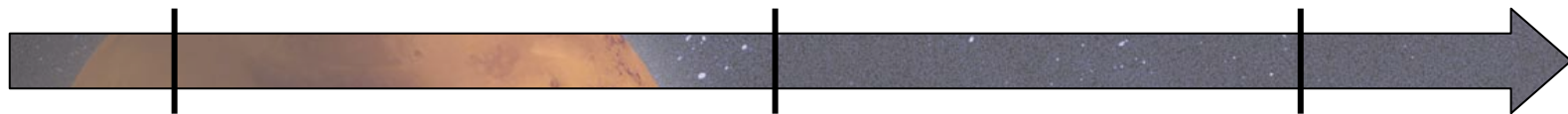
OSIRIS-4QD



+



- Four-Quadrant Tracker + EDFA
- Closed-loop tracking of a laser-beacon sent from the Ground Station
- Little additional weight
- **Greatly increases pointing/tracking accuracy**



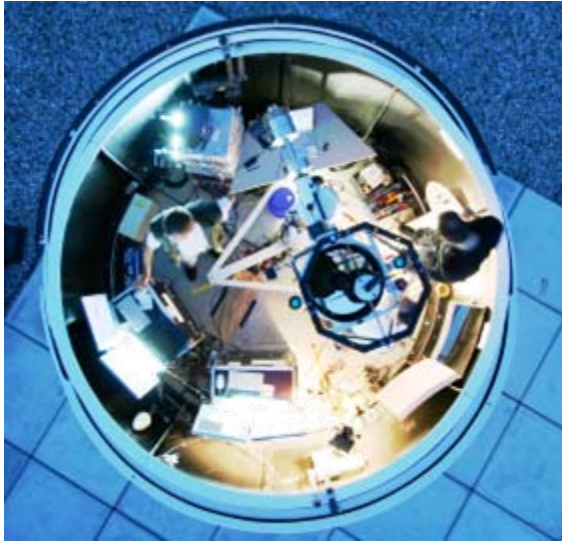
OSIRIS-HPLD

OSIRIS-EDFA

OSIRIS-4QD



Available Optical Ground Stations (OGS)



OGS Oberpfaffenhofen

- 40 cm Cassegrain
- Measurement Devices for Atmospheric Parameters



Transportable OGS

- 60cm Ritchey-Chretien
- „Anywhere in the world“



ESA-OGS

- 1m Telescope
- Tenerife (Canary Islands)



Contact Information

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