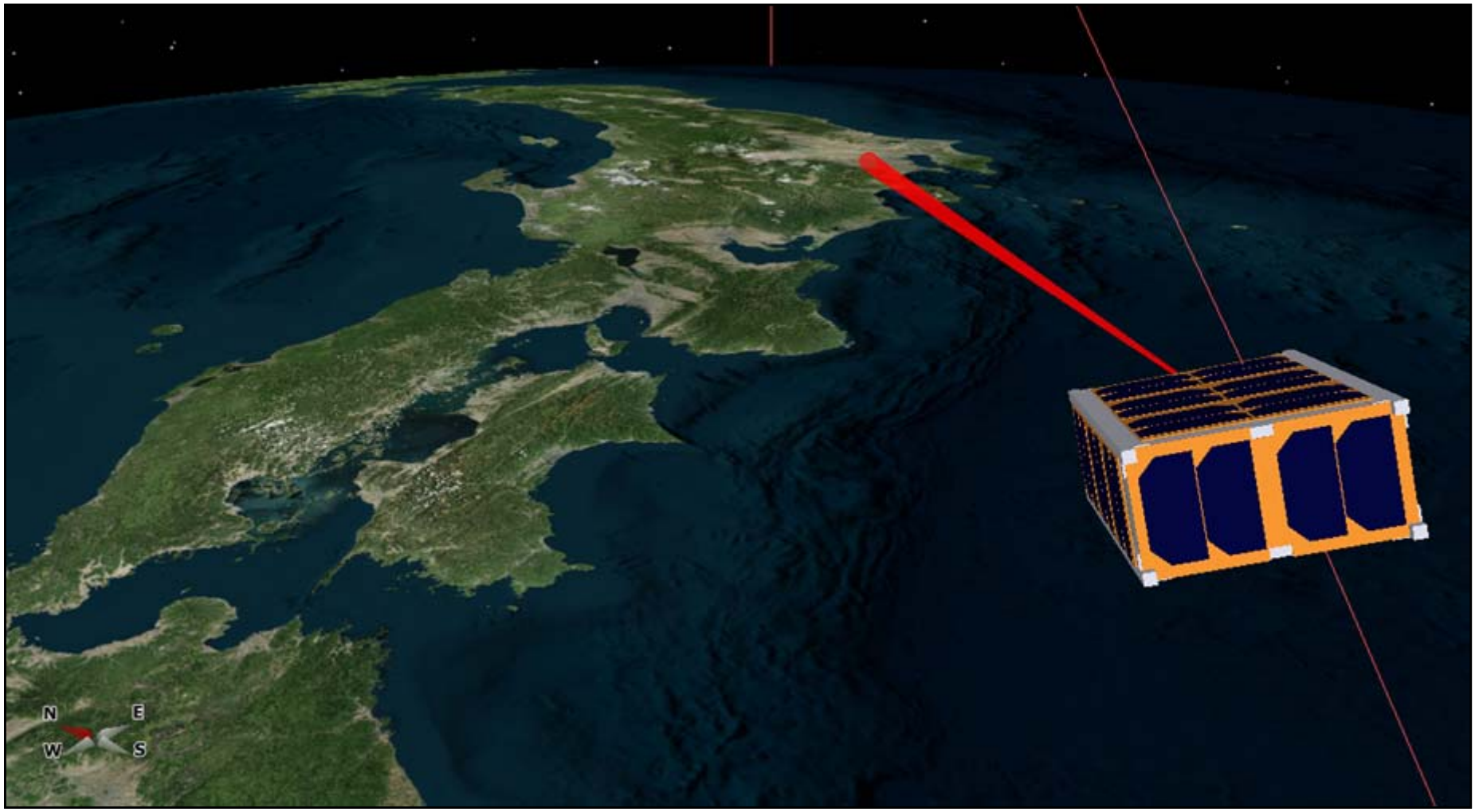
Group Discussion 1 - Space laser communications



7th UNISEC Global Meeting

30 November 2019

National Institute of Information and Communications Technology (NICT)

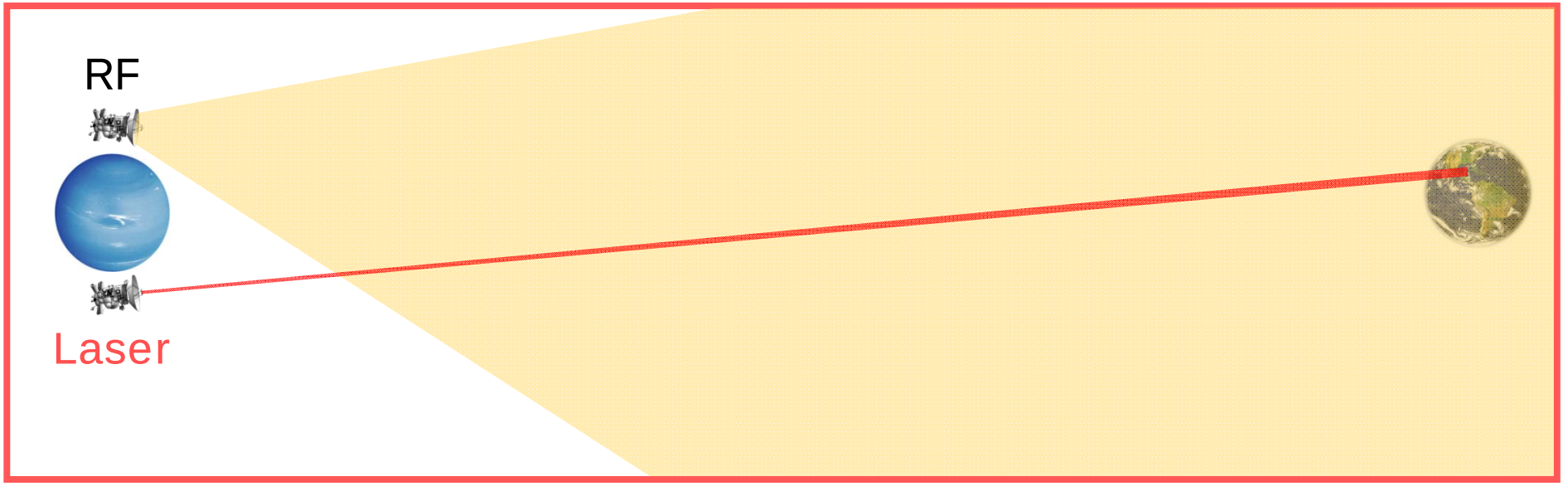
What is space laser communications?

Advantages

- Low divergence
- High data rate
- Low SWaP
- No regulation!

Drawbacks

- Accurate pointing
- Atmosphere

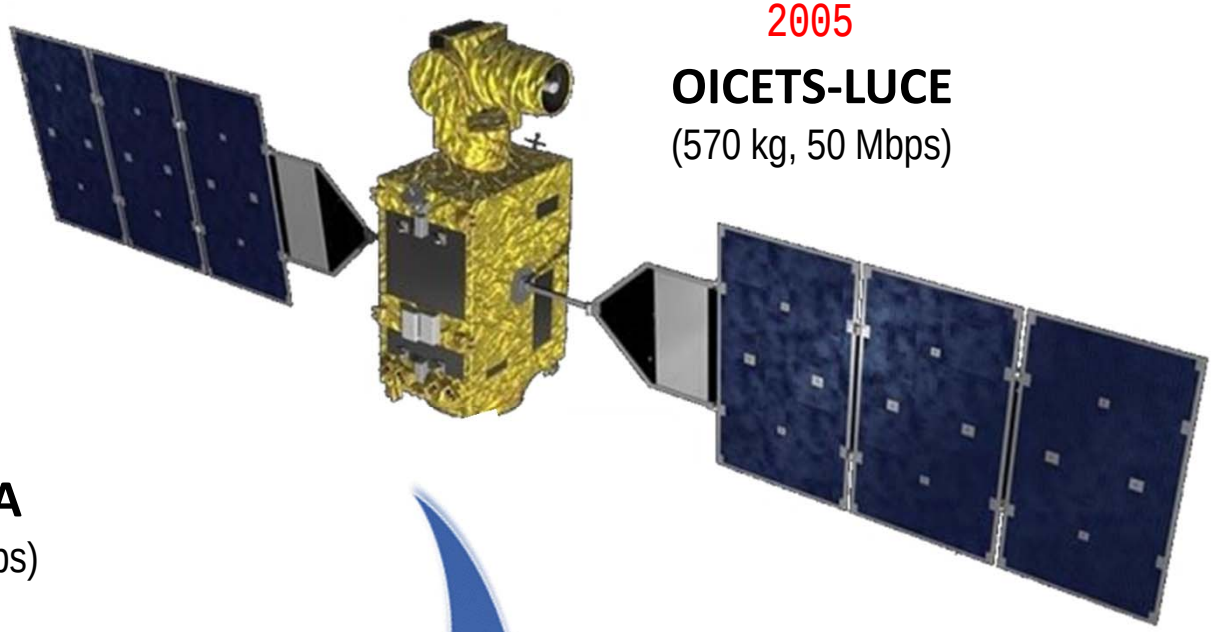


Evolution of NICT LEO lasercom terminals

2005

OICETS-LUCE

(570 kg, 50 Mbps)



2023

CubeSOTA

(14 kg, 10 Gbps)

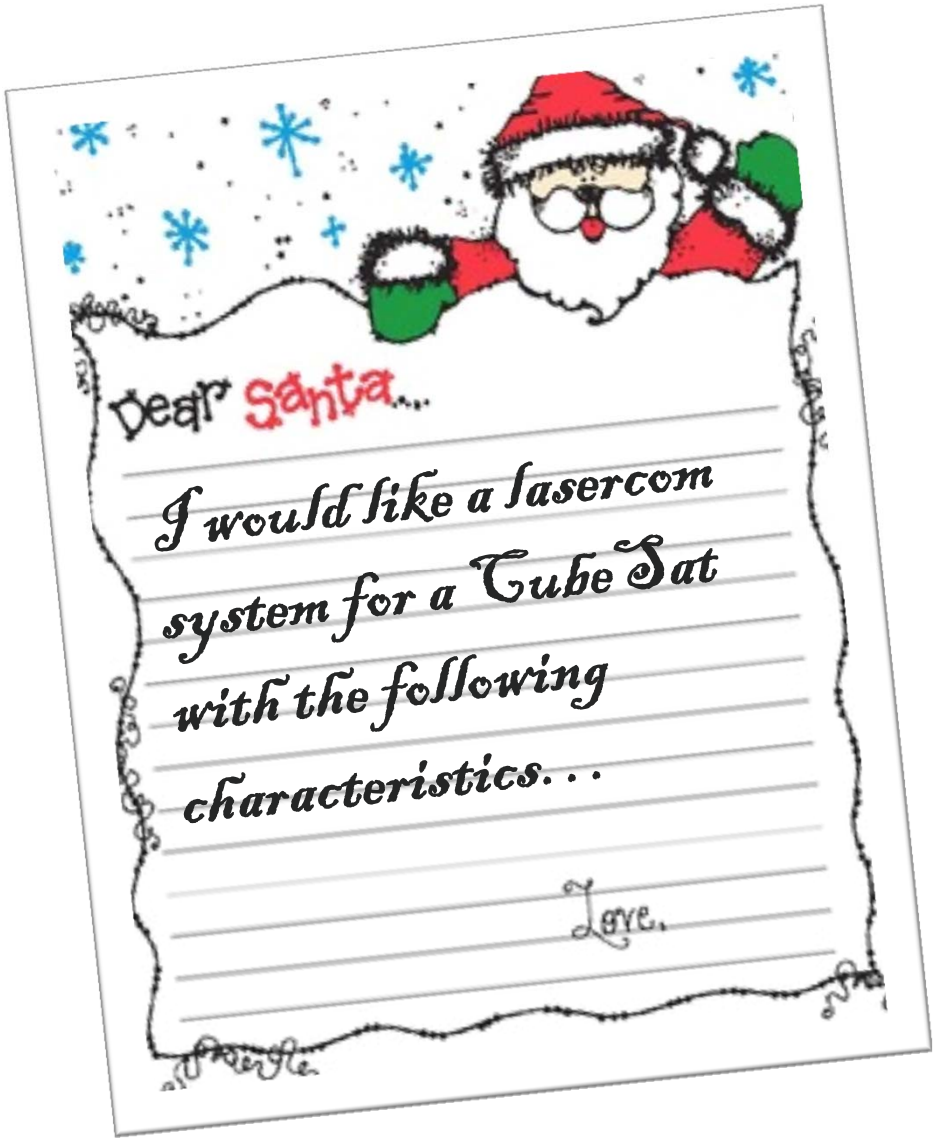
2014

SOCRATES-SOTA

(50 kg, 10 Mbps)

Letter to Santa Claus

- Let's find out what the CubeSat community would expect from lasercom compared to RF
- The ideal goal is to imagine a hypothetical commercial lasercom terminal that could fill an existing gap in current CubeSat components
- NICT is interested in demonstration missions that prove feasibility of potential commercial products, leveraging risk of private sector



Let´s start with…

- How critical is spectrum allocation for RF systems in CubeSats?
- Is it an advantage of lasercom, if RF is needed anyway for TTC?
- Under what conditions lasercom could replace RF completely?
- What is better: own ground station or shared network (service)?
- What should lasercom have to be superior to x-band systems?
- What are the current problems of x-band as a high-speed solution?
- What is the maximum volume allocation for the lasercom terminal?
- Should ADCS be a requirement for lasercom or an added feature?
- Would a Globalstar-like service be a solution for CubeSat lasercom?
- Would lasercom be an enabling solution for CubeSats in deep space?
- Is QKD an interesting technology/service for CubeSats?
- What demand would CubeSat lasercom have commercially?
- What new applications could high-speed lasercom enable?
- …

Thank you!

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東京大学
THE UNIVERSITY OF TOKYO