

Antennas for Satellite Systems

Background and challenges

High throughput satellites (HTS) – Ka band

HTS can provide broadband internet access almost anywhere, namely in maritime or rural environments, at low cost.

Challenges

- **Space Segment:** reduce the number of antennas and weight.
- **Ground Segment:** provide affordable and small terminals with low power consumption.



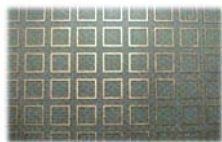
Description and main innovation



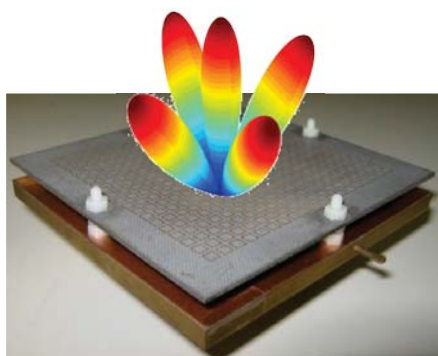
Space Segment

Reflectors number reduced from **4 to 1**

- **Multiple spot beam**
- **Dual band** operation
- **Low profile** feed array



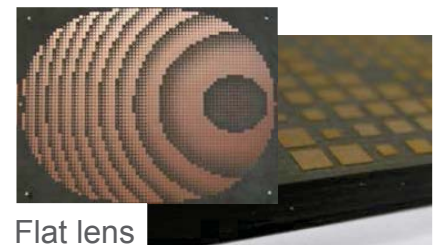
Lens surface



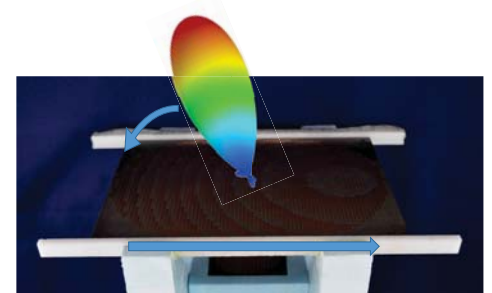
Spot beam coverage

Ground Segment

- **Low profile** antenna with mechanical scanning
- **Beam steering** antenna
- High Gain
- Zoned **flat lens** (3.35 mm thickness)
- **Low weight**
- **Low cost**



Flat lens



Achievements

- 3 PhD thesis of which 1 is in the IST/EPFL Joint Doctoral Program.
- Outputs: 4 prototypes, 2 submitted manuscript and 10 conference communications.
- Associated projects:
 - European Science Foundation (ESF), under the Research Network Program NEWFOCUS;
 - European Space Agency (ESA), contract no. 4000109111/13/NL/AD.

