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OPTICAL COMMUNICATION CAPABILITIES OF THE ELECTRA PLATFORM

Abstract

This paper describes the concept of embarking a Laser Communication Terminal onto the OHB Small-GEO platform ELECTRA.

With the increase of data rate demands both of Telecom and Earth Observation satellites flying at low orbits,, a Relay Satellite System from GEO orbits has become a very important asset to cover both user traffic and earth observation data relay needs. Near real-time information can be exchanged from a LEO satellite to ground, thanks to Optical Inter Satellite Links between LEO and GEO, and then via RF from GEO to ground. With this concept OHB has already successfully manufactured EDRS-C for the European community, which is in orbit since 2019.

Optical Inter Satellite links would also allow flexibility on gateway locations, not been these ones linked to coverages in view of the satellite providing the capacity to the final users. End to end users communication, independently from user location, would also be possible in single-hop connections thanks to Inter Satellite links, decreasing latency and saving frequency spectrum.

With this paper we would like to illustrate the solution we have put in place to enable the ELECTRA platform (able to carry up to 800Kg / 10KW Payload) to embark one or two Laser Communication Terminals. The preliminary key performances has been analysed (micro-vibration, pointing budget, etc.), together with some typical link performances between GEO-LEO and GEO-GEO satellites.

A trade-off between RF ISL in V-Band vs Ka-band vs the Optical intersatellite links will be presented, where the advantages of Optical communication are demonstrated over the other frequency bands.