

# **Laser Communication Experiments at Grasse - France Station (ID7845) and Prospective Applications for Satellite Laser Ranging**

D-H. Phung<sup>1\*</sup>, E. Samain<sup>2</sup>, J. Chabe, C. Courde<sup>1</sup>, N. Maurice<sup>1</sup>, H. Mariey<sup>1</sup>, G. Artaud<sup>3</sup>, J-L. Issler<sup>3</sup>

<sup>1</sup> Université Côte d'Azur, CNRS, Observatoire de la Côte d'Azur, IRD, Géoazur,  
2130 Route de l'Observatoire 06460 CAUSSOLS, France

<sup>2</sup> SigmaWorks, 8 Allée Bellevue 06460 SAINT VALLIER DE THIEY, France

<sup>3</sup> CNES - French Space Agency, 18 av Edouard Belin, TOULOUSE, France

## **Name and contact of the first author\*:**

Dr. Duy-Hà PHUNG, 2130 Route de l'Observatoire 06460 CAUSSOLS France,

Phone : +33 (0)4 93 40 54 21, email : [Duy-Ha.PHUNG@geoazur.unice.fr](mailto:Duy-Ha.PHUNG@geoazur.unice.fr)

## **ABSTRACT**

The MeO optical ground station, located in Grasse-France, was designed at the end of 1970's in the framework of lunar laser ranging (LLR). Today, in addition to the LLR program, the station is part of the ILRS network (ID7845) and participates to various laser applications including Satellite Laser Ranging (SLR), Time Transfer by Laser Link (T2L2), high-resolution imagery, and debris detection. In recent years, Laser Communication (LaserComm) have been identified as key technologies for future high data rate transmissions between satellites and ground, the France Space Agency (CNES), in collaboration with Geoazur, is investigating the use of optics both for high data rate from observation satellites to Earth and for future telecommunications applications. Since 2014, the MeO telescope has been upgrading in order to be able to take part in LaserComm experiments. The main challenges of these experiments are the implementation of a complete laser communication from space to ground and the characterization of the turbulent atmosphere during the optical data transfer. Several campaigns have been performed since 2015 between MeO station and LaserComm satellites at low Earth orbit. In the presentation, we will first give a global view of the whole OGS with some details on the transmitter, the telescope, the receiver bench and the dedicated instrumentation used to monitor the telecom link. Principal results obtained in the frame of the LaserComm campaigns will be presented. We also show our new developments for LaserComm at high data debit (1 Gbps and 10 Gbps). In the end, we present our prospective applications for SLR.

Topic Codes:

Session 3: Synergies and new applications

-- Laser communication

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