

General Assembly of the Alphasat Aldo Paraboni Propagation Experimenters

Future broadband satellite communication systems shall offer terabit capacity and very high data rates as requested by the current market both for broadcast and multimedia applications. The goal is to offer satellite-based solutions competitive to the ones provided by the terrestrial network, with in addition the ability to reach directly any end user, whichever his location. This requires the use of high carrier frequencies in the Ka or Q/V bands and beyond in order to achieve the large bandwidth requested.

The utilization of millimetric waves (Ka, Q, V bands and above) in satellite communications requires the use of Propagation Impairments Mitigation Techniques (PIMT) to counteract severe atmospheric phenomena without excessive power expenditures. The possibility to design and exploit profitably these techniques is based on the knowledge coming from the propagation science, i.e. on accurate models for the space- and time-distribution of attenuation and on measurements for their validation.

From 2014 a new European measurements campaign at Ka and Q band is possible thanks to the **Alphasat Aldo Paraboni payload**, in name of the scientist who conceived it. The payload implementation, launch and operations are supported by the Italian Space Agency (ASI) as contribution to the Technology Demonstration Payload of Alphasat project, implemented by the European Space Agency (ESA) in the framework of the ARTES 8 Telecom programme.

The **Alphasat satellite was launched successfully on July 25, 2013**. The Aldo Paraboni Scientific (propagation) payload is operational since the end of 2013 and it allows simultaneous long-term measurements of attenuation and depolarisation at 19.701 and 39.402 GHz all over Europe.

In 2016 ESA extended the operations of the Alphasat Aldo Paraboni payload until the end of 2019.

In addition to the initial network, including the main ASI stations installed in Tito Scalco and Spino d'Adda, Italy, and the Joanneum Research ground station, installed in Graz, Austria, several European research centres (presently about 15) and NASA have joined the scientific campaign. This is expected to provide to the scientific community new experimental data allowing the validation, among the others, of models of space-time correlation of rain/attenuation fields, of site diversity at small and large scale, and of spatial correlation of cloud fields. All these developments shall contribute to radio regulations and support the implementation of new satellite communication systems.

In order to achieve these objectives, a strong coordination of the experimenters is essential, as demonstrated by previous projects (COST 205 project on OTS and Sirio satellites, the ESA OPEX for Olympus, the NASA NAPEX for ACTS, the ASI CEPIT for ITALSAT and, more recently, the COST IC0802 for Ka band campaigns) and by contributions to ITU-R Study Group 3, Radiowave Propagation, and ITU-R-P recommendations for SatCom systems.

For these purposes, in 2014 ASI and ESA promoted the constitution of the collaborative **Group of the AlphaSat Aldo Paraboni propagation Experimenters (ASAPE)**, which is an open forum of researchers performing propagation campaigns with the Aldo Paraboni payload and other satellite payloads at Ka band. Topics include: instruments, design and execution of campaigns, data analysis, use of remote sensing and meteorological data and use of numerical weather products. The group intends also to be a reference on the use of measurements for the development of models and theoretical advances and to actively pursue transfer of results to industry and into radio regulations. The group held its previous General Assemblies on October 2014 and 2015, during the Ka and Broadband Communications Conference. In addition since 2015 the Group organises periodic intermediate meetings and has planned a WG and programmatic Workshop for 2016 (24-26 October 2016).

The **Third General Assembly of ASAPE will be held on October 18 2016**, during the 22nd Ka Band Conference. It **will be hosted at the NASA Glenn Research Center facility** and will have the main objective to present and discuss publicly the progress of the campaign and to plan ASAPE activities for the following period.

Group of the Alphasat Aldo Paraboni Propagation Experimenters (ASAPE)

The 3rd General Assembly

Tuesday, October 18, 2016

08:00-12:00 (EDST)

NASA Glenn Research Center
(Cleveland, OH, United States)

Held in collaboration with the
Conference Organizing Committee of the
22nd Ka and Broadband Communications Conference.

Preliminary agenda:

1. Update on the Campaign (C. Riva and A. Martellucci)
 - Status of the experiment at the end of the third year of campaigns
 - Extension of the operation of the Alphasat Aldo Paraboni payload to 2019
2. Presentations from Experimenters on:
 - Instruments. Facilities and Measurements Planning
 - Experimental issues
 - Data analysis
 - Preliminary results.
3. Planning for ASAPE activities in 2016 and 2017
 - ASAPE WGs and Programmatic WS in 2016 (24-26 October 2016)
 - Round the table discussion
4. Conclusions/AoB

Who is interested in attending the meeting at NASA premises shall contact Prof. [Carlo Riva](#), by September the 2nd, 2016, to provide the required documents to access NASA premises.

All participants interested to contribute to the meeting are invited to contact [Carlo Riva](#) (cc [Antonio Martellucci](#)) to submit before the end of **September 2016** their proposal for the meeting.

Interested participants who do not plan to attend the Ka Band Conference are invited to register to this meeting only contacting the Conference Organizing committee (organizingcommittee@kaconf.org).

The documentation of the meeting will be made available to ASAPE registered participants using the ASAPE DAPTIV project area provided by ESA.