Duration: 08:30 - 17:50
Room: St. Petersburg

WS-04
Equipment and Antennas for Satellite Communication

Organisers:
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Michael Schneider, Airbus, Germany

Abstract
The continuously increasing need for capacity and flexibility results in a wide range of new developments for satellite communication. Components and equipment for higher frequencies, for example Q- and V-band have been developed as higher frequency bands provide a wider bandwidth and so data capacity can be increased. Additionally to RF performance, mass and cost are of increasing importance. Therefore also new manufacturing methods for cheap and lightweight waveguide components and antennas are required. Power handling and thermal aspects have to be considered, too. The equipment must be safe against multipaction and corona, but in space also the dissipation power is a challenging task. To minimize the dissipation power, amplifiers with a high efficiency are needed.

Both, telecommunication satellites and data downlink systems for observation satellites, have to deal with very high capacity needs. In order to use the available frequency spectrum as efficient as possible, new technologies like flexible antennas, flexible payload, on-board data processing or MIMO have to be used. Antennas, payload and data processing cannot be considered separately from each other. For the new requirements integrated solutions are necessary. Of course not only the space segment but also ground stations and user terminals have to be adapted to these new needs. Especially for nomad or mobile users, satellite communication is of high importance.

Objective of this workshop is to address this wide range of modern concepts and hardware for satellite communication.

Programme

08:30 - 08:40 Welcome and Introduction

08:40 - 09:10 State-of-the-Art Approaches to RF Breakdown Analysis and Their Impact on Applicable Margins
Carlos Vicente, Aurorasat, Spain

09:10 - 09:40 Advanced Techniques of Feed Horn Antenna Design for Modern Communication Satellites
Aitor Martinez Agoues, Anteral, Spain

09:40 - 10:10 Efficient Techniques for Complex Filter and Multiplexer Design with 3D FEM
Adam Lamecki, Gdansk University of Technology, Poland

10:10 - 10:50 Break

10:50 - 11:15 Design and Manufacturing of Waveguide Components Using ALM
Michael Kilian, Airbus, Germany

11:15 - 11:40 Concepts for Multi-Mode Dielectric Resonators
Michael Höft, University Kiel, Germany

11:40 - 12:05 Realisations of Flexible Waveguide Filters
Christian Arnold, Tesat-Spacecom, Germany

12:05 - 12:30 Component Development for Commercial Q/V Band Payloads
Jim Sowers, SSL, USA

12:30 - 13:50 Break

13:50 - 14:15 Cost Efficient Data Downlink Subsystems on Low Earth Orbit Observation Satellites
Patrick Thiemer, Tesat-Spacecom, Germany

14:15 - 14:40 Onboard Signal Pre-Distortion for High Throughput Satellites: Algorithms and Application Examples
Ovais Usman, Munich University of the Bundeswehr, Germany

14:40 - 15:05 On-Board Processing for Future Satellite Constellations
Rainer Wansch, Fraunhofer ISS, Germany

15:05 - 15:30 Space Developments at IMST: Ground Segment and Payload
Rens Baggen, IMST, Germany

15:30 - 16:10 Break

16:10 - 16:40 Active Antennas Activities at Space Engineering for Space and Ground Applications
Piero Gabellini, Space Engineering, Italy

16:40 - 17:10 Satellite Data Downlink Antennas
Joakim Johansson, Ruag, Sweden

17:10 - 17:40 Future Land Mobile Satellite Communication Terminals at Ku- and Ka-Band
Ferdinando Tiezzi, Viasat, Switzerland