Latest update of JAXA's UWB technology demonstration
Johta Awano - Japan Aerospace Exploration Agency (JAXA)

Over the past few years, we have been developing intra-satellite wireless communication technology using UWB scheme. Currently, UWB communication components have been installed on the ETS-9 satellite (the Japanese Engineering Test Satellite-9), which is scheduled to be launched within the next one or two years. In my presentation, I will give a brief overview of the communication component's functions and performance, as well as discuss future studies on upper-layer design.

Design of a Monolithic Integrated UWB-Transceiver for Space Applications
Gunter Fischer – IHP Microelectronics

The presentation will provide details about the design requirements, implementation challenges and experimental results of an UWB transceiver for Space applications. The first part will deal with the general design of the IEEE standard-compliant UWB transceiver intended for wireless data communication as well as high-precision indoor localization. The second part focusses on Space-specific requirements like radiation hardness (analogue frontend, digital control, chip-internal supply), built-in self-test options, and challenges in operating the UWB-solution in an irradiated environment.

Differential Lunar Satellite Navigation with UWB-Enabled Rover Swarms
Euiho Kim – Hongik University, Seoul

This study introduces strategies for establishing a differential Lunar Navigation Satellite System (LNSS) on the Moon using a swarm of lunar rovers. Differential satellite navigation enhances user positioning accuracy by broadcasting correction messages derived from raw measurements collected at multiple reference receivers with precisely known antenna coordinates. However, determining these reference antenna coordinates is challenging due to the absence of high-precision positioning infrastructure on the lunar surface. To address this, we propose a cooperative positioning framework in which a swarm of lunar rovers equipped with LNSS receivers and ultra-wideband (UWB) technology jointly estimate their positions and refine the coordinates of the reference stations. Simulation results show that the proposed differential LNSS approach achieves 3D user positioning accuracies better than a few meters when employing four or eight satellites.

Deployment of a Modular Ultra Wideband Avionics Platform
Andre Lübken – German Aerospace Center (DLR)

The transition from wired to wireless avionics marks a shift in spacecraft design, offering reduced mass and harness complexity, simplified integration, and increased configuration flexibility. This presentation explores the development and deployment of a modular Ultra-Wideband (UWB) wireless avionics system designed for intra spacecraft use.

A technical overview of the hardware and software platform is provided, detailing the architectural choices that provide a robust, interference-resistant communication in the harsh space environment. To demonstrate the technology's versatility, the talk features a showcase of diverse mission deployments.