Day 2 (Wednesday, 26 October) 9:30 - 11:00, Hall A
Technical Session 1　Communication and Navigation Systems

T1-1-A

A Secure Ground Handover Protocol for LDACS

Nils Mäurer, Thomas Gräupl (German Aerospace Center (DLR)), Corinna Schmitt (Universität der Bundeswehr München), Christoph Rihacek, Bernhard Haindl (Frequentis AG)

The L-band Digital Aeronautical Communications System (LDACS), the worldwide first true integrated Communication, Navigation and Surveillance (CNS) system, is in the process of being standardized at the International Civil Aviation Organization (ICAO) and the Internet Engineering Task Force (IETF).
The cellular system is considered a successor to the 30-years old Very High Frequency (VHF) Datalink mode 2 system (VDLm2) and intended for communications related to the safety and regularity of flight. With the initial rollout planned in the near future, the finalization of all its aspects, including security is of utmost importance. While previous works presented a cybersecurity architecture for LDACS, including a Public Key Infrastructure (PKI), certificates, a Mutual Authentication and Key Establishment (MAKE) procedure, as well as usage of established keys for protecting its user- and control-data plane, the protocol for secure LDACS handovers between cells has not been established. The objective of this work is to present a secure handover procedure for LDACS, fulfilling all security and performance requirements for data- and voice communications via LDACS.

T1-2-I

LDACS Validation Activity in ENRI and Cooperation with DLR

Kazuyuki Morioka (Electronic Navigation Research Institute, MPAT), Thomas Gräupl, Michael Schnell (German Aerospace Center (DLR))

The L-band Digital Aeronautical Communications System (LDACS) is currently being standardized at the International Civil Aviation Organization (ICAO) for the next-generation air-to-ground aeronautical communication system. The Electronic Navigation Research Institute (ENRI) in Japan is developing LDACS prototypes and contributing to the ICAO standardization. In this presentation, we introduce the validation activity in ENRI. Further, we have started co-operative work with the German Aerospace Center (DLR) in Germany on LDACS. This presentation also introduces our collaborative work, current status, and future plans.

T1-3-I

Observation of sporadic E using aeronautical navigation radio for instrument landing system

Shumpei Tabuchi, Keisuke Hosokawa (University of Electro-Communications), Susumu Saito (Electronic Navigation Research Institute, MPAT), Jun Sakai, Ichiro Tomizawa (University of Electro-Communications), Toru Takahashi (Electronic Navigation Research Institute, MPAT), Hiroyuki Nakata (Chiba University)

Sporadic E (Es) observations were conducted in Kure, Japan, by using a software receiver and an Instrument Landing System receiver for aircraft. We confirmed that the source of the anomalous propagation at 110.30 MHz observed in Kure was the Localizer Type Directional Aid at Hualien Airport in Taiwan. We also observed a systematic change in the angle-of-arrival of the received signal, which may be used for observing the spatial structure of Es.