

## Radio channel modelling and emulation for NTN and for terrestrial sub-THz links



Pekka Kyösti received the M.Sc. degree in mathematics and the D.Sc. (Hons.) in communications engineering from the University of Oulu, Finland. He is currently a senior specialist with Keysight Technologies Finland Oy, a research director in 6G Flagship programme, and a docent (adjunct professor) with the Centre for Wireless Communications (CWC), University of Oulu. His present activities are radio channel characterization for 6G systems, and channel modelling and over-the-air emulation for 5G systems.

He has contributed on channel modelling and OTA testing on many standardization fora such as ITU-R, 3GPP, CTIA, and IEEE 802. He has acted in contributor and task leader roles in many European research projects such as WINNER (I,II,+), METIS, and Hexa-X (I,II).

**Title:** 5G NTN Radio Propagation Modeling with Channel Emulation Platforms

**Abstract:**

Here we will first take a look at the 5G NTN from standardization and industry development point of view – how the 5G NTN is reshaping the satellite industry. Second, we will map the main use cases of the 5G NTN, which are the driving factors for the current technology development and industry investments. Finally, we will take a deep dive into the channel modeling aspects and details of the 5G NTN specific satellite propagation channels – how the models are defined, developed, and implemented in practice using FPGA based signal processing platform.

**Speaker:** Jani Tolonen, Product Manager, Keysight Technologies

**Title:** The first radio channel emulation of a sub-THz channel model

**Abstract:** We describe propagation measurements, channel modelling, and emulation of the developed channel model at a sub-THz radio frequency. A stored channel model based on

stationary 140 GHz directional measurements is the starting point. The model is enhanced by time variant elements, e.g., human blockage events. Two example scenarios, characterizing transition from LOS to NLOS and an entrance hall with moving human blocker, are implemented in fading emulator. Emulated channels are measured in a laboratory and compared to the original channel model. This is a demonstration of the first channel emulation of a D-band fading model.

**Speaker:** Pekka Kyösti, Senior Specialist, Keysight Technologies

### Workshop outline:

The workshop is composed of two technical presentation and a Q&A after each presentation. The first presentation is about propagation modelling and channel emulation for 5G Non-Terrestrial Networks. The first part will take 45 min and be given by Jani Tolonen. The second presentation is about the first radio channel emulation of a sub-THz channel model, given by Pekka Kyösti.

