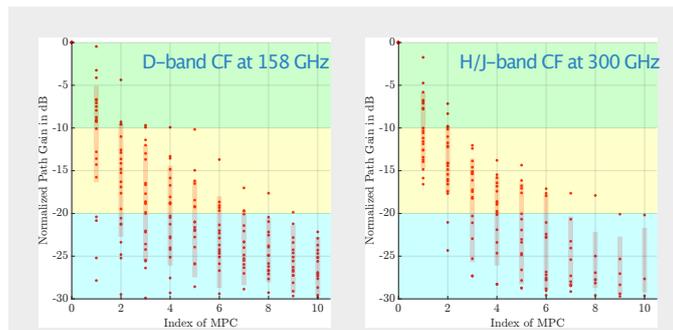
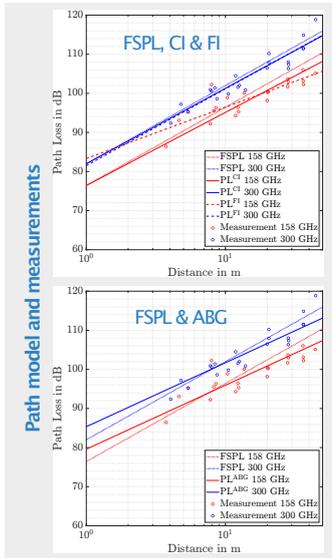


Sub-TeraHertz (Sub-THz) Channel Sounding and Analysis: D-Band vs H-Band in Shopping Mall and Dual-Polarized D-Band in Industrial Environment

AlperSchultze / MathisSchmieder / RamezAskar / MichaelPeter / WilhelmKeusgen

Analyzing Sub-THz Radio Channel Characteristics: A Comparative Study at 158 GHz and 300 GHz within a Shopping Mall Environment [1]



Statistical visualization of a normalized-with-respect-to strongest-component MPC by means of box plots; three path-loss dynamics ranges – (10 dB granularity) – are highlighted within 30 dB overall analysis dynamic.

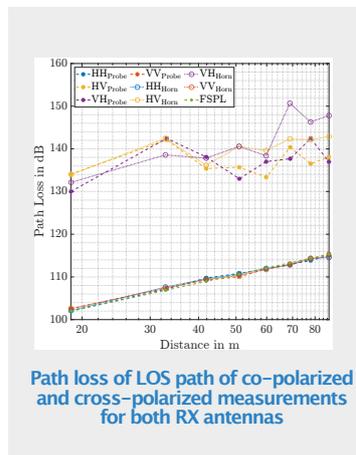


A photograph of the measurement environment representing an indoor shopping mall environment.

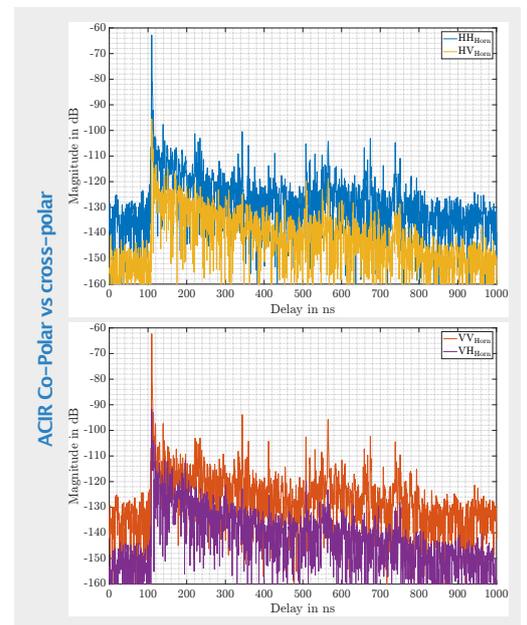
Dual-Polarized Sub-THz Channel Measurements in the D-Band: Assessing Characteristics in an Industrial Environment [2]



A photograph of the measurement environment representing an industrial environment



Path loss of LOS path of co-polarized and cross-polarized measurements for both RX antennas



KEY FINDINGS

- Path loss modeling for 158 GHz and 300 GHz: In a shopping mall environment, the CI model fits better for short distances and the FI model for larger distances within the measured measurement data. The ABG model as a multi-frequency model delivers acceptable results, however needs more input parameters.
- Multipath behavior of the sub-THz radio channel in the mentioned scenario, in most of cases one additional path besides the LOS is detected within an evaluation threshold of 10 dB for both CFs. By expanding the evaluation threshold to 20 dB, up to 7 additional paths besides the LOS path are observable.
- In the sub-THz D-band frequency range, the LOS path is primarily affected by cross-polarization, leading to an average polarization loss of around 30 dB with regards to the FSPL.

[1] A. Schultze, M. Schmieder, R. Askar, M. Peter, W. Keusgen and T. Eichler, "Comparison of Sub-THz Radio Channel Characteristics at 158 GHz and 300 GHz in a Shopping Mall Scenario," in 2024 18th European Conference on Antennas and Propagation (EuCAP), March 2024.

[2] A. Schultze, M. Schmieder, R. Askar, M. Peter, W. Keusgen and T. Eichler, "Dual-Polarized Sub-THz Channel Measurements in D-Band in an Industrial Environment," in 2024 European Conference on Networks and Communications & 6G Summit (EuCNC/6G Summit), June 2024, (submitted).