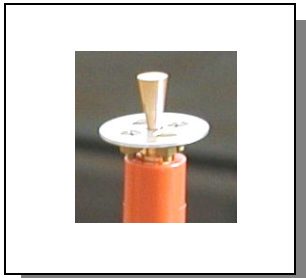


SIMO Measurements in an Industrial Indoor Environment

Measurement Setup:

- Propagation situation: Change from non-line-of-sight to line-of-sight, Tx antenna moved at 10 km/h, Rx antenna fixed
- Place: DaimlerChrysler Aerospace AG (DASA), Hamburg-Finkenwerder
- Carrier frequency: 5.2 GHz, bandwidth: 120 MHz, maximum excess delay 3.2 μ s, transmitter power: 27 dBm



Transmit antenna:

omnidirectional single element with vertical polarization

height above ground: ca. 1.8 m



Receive antenna:

8 elements uniform linear patch array (ULA), vertical polarization

element separation: 0.4λ

height above ground: ca. 6 m

References:

Characterization of the Directional Mobile Radio Channel in Industrial Scenarios, Based on Wide-Band Propagation Measurements

D. Hampicke, A. Richter, A. Schneider, G. Sommerkorn, R.S. Thomä, U. Trautwein
(Proc. IEEE Vehicular Technology Conference Fall '99, Amsterdam, The Netherlands, 1999)

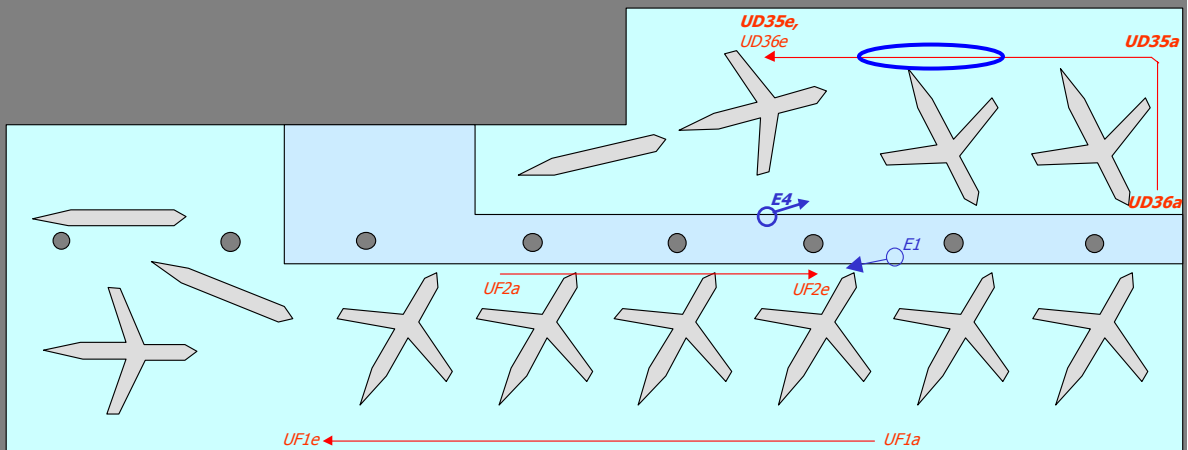
Performance of Space-Time Processing for ISI- and CCI-Suppression in Industrial Scenarios

U. Trautwein, D. Hampicke, G. Sommerkorn, R. Thomä
(Proc. IEEE VTC2000-Spring, Tokyo, Japan, May 2000)

Photograph and sketch of the measurement environment:

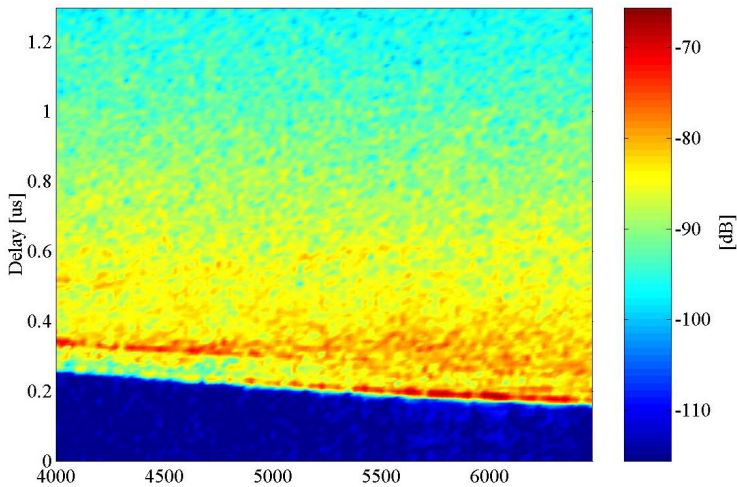


The receive array looks towards the Tx track from a gangway with an elevation of about 6 m above the ground. Strong reflections are caused by many metal objects.

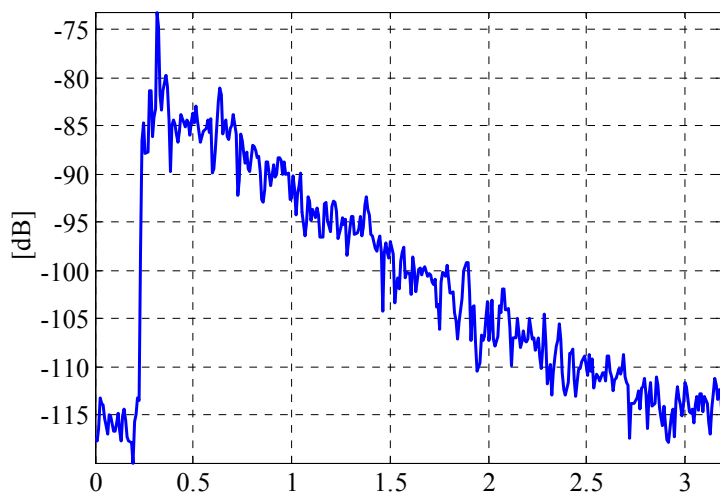


The sample data include 100 consecutive snapshots with a spacing of about 7.5λ from a measurement track starting at UD36a, passing UD35a, and ending at UD36e (encircled in blue). The receiver array location and orientation is indicated by the arrow E4. The data represent a transition from a NLOS situation (LOS is obstructed from the upper middle aircraft body) to a LOS situation.

Selected data view:

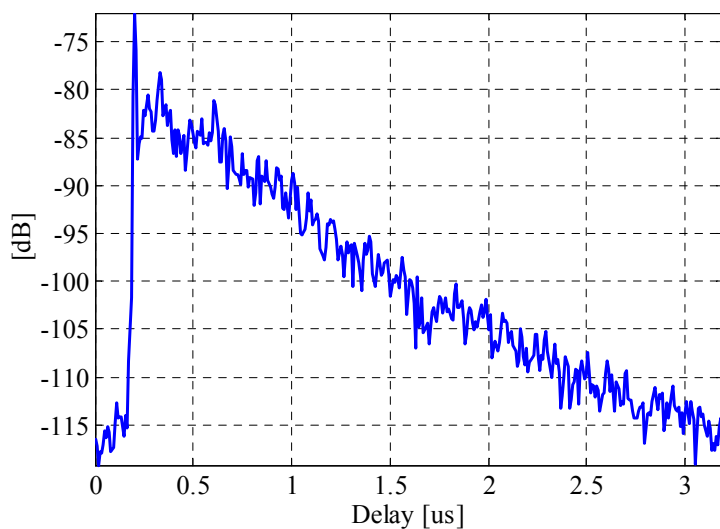


Time-variant delay spectrum averaged over all Rx antenna channels with a transition from NLOS to LOS.

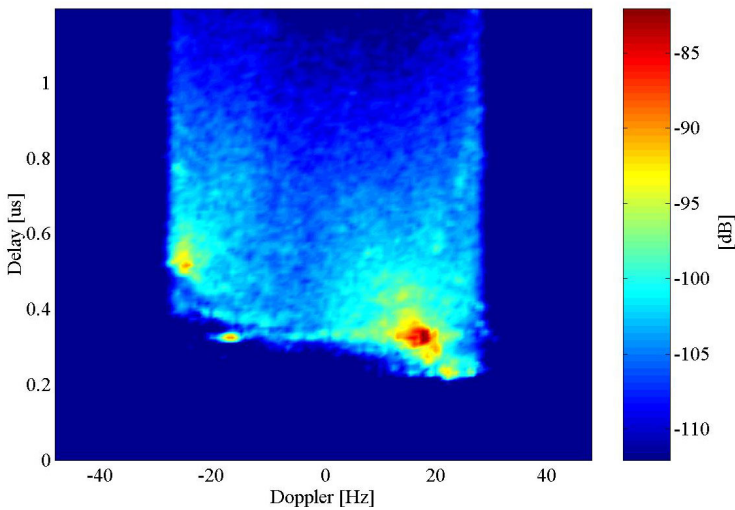


Delay spectrum: single snapshot averaged over all Rx antenna channels

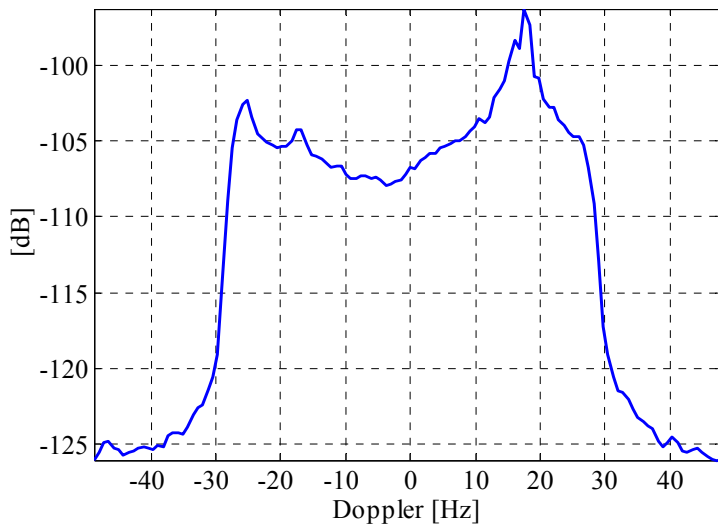
Non-line-of-sight



Line-of-sight



Delay-Doppler spectrum averaged over all Rx antenna channels for the NLOS section.



Corresponding delay averaged Doppler spectrum

It resembles pretty close the classical Jakes type Doppler spectrum although the receive array has only a 120° field of view.

Advanced parameter estimation results:

Presently not available. From the impulse response plots it is obvious that the identification of individual multipath components is hard to achieve.

Measurement file remarks:

- Array calibration including coupling compensation for the ULA (five diagonals)
- No phase alignment to compensate the temporal offset between capturing the individual antenna channels (cf. [time diagram](#))
- Filename: <http://www.channelsounder.de/downloads/dasasimo1.zip>