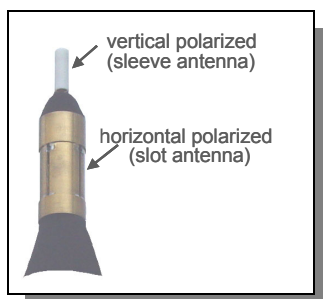


Measurement Setup:

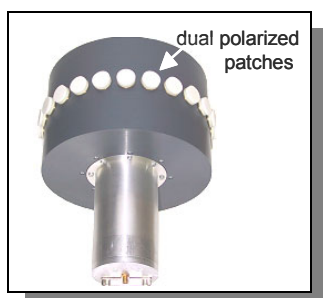
- Propagation situation: line-of-sight, Tx antenna moved at walking speed, Rx antenna fixed
- Place: Courtyard at Ilmenau Technical University, surrounding building's height ca. 12 m
- Carrier frequency: 5.2 GHz, bandwidth: 120 MHz, maximum excess delay 3.2 μ s, transmitter power: 33 dBm



Transmit antenna:

omnidirectional single element with separate ports for horizontal and vertical polarization

height above ground: ca. 2.5 m



Receive antenna:

omnidirectional 24 elements uniform circular patch array with separate ports for horizontal and vertical polarization (PUCPA)

element separation: 0.4515λ

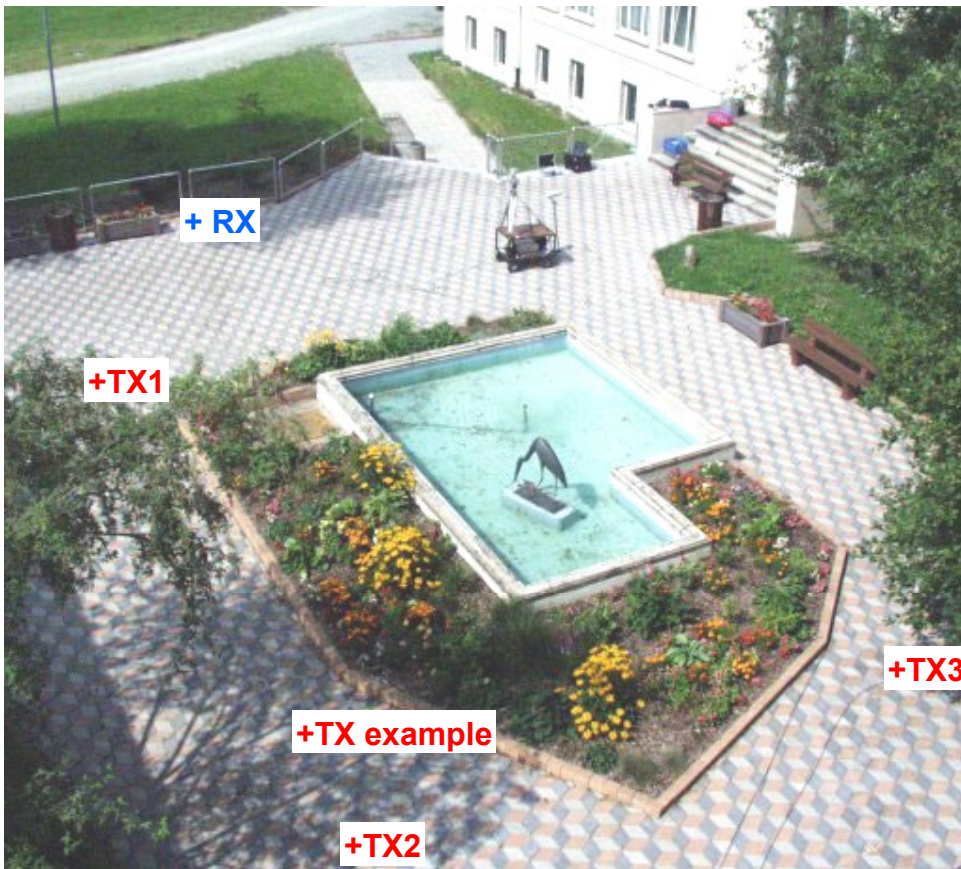
height above ground: ca. 2 m

References:

[Estimation of Multidimensional Polarimetric Channel Model Parameters](#)

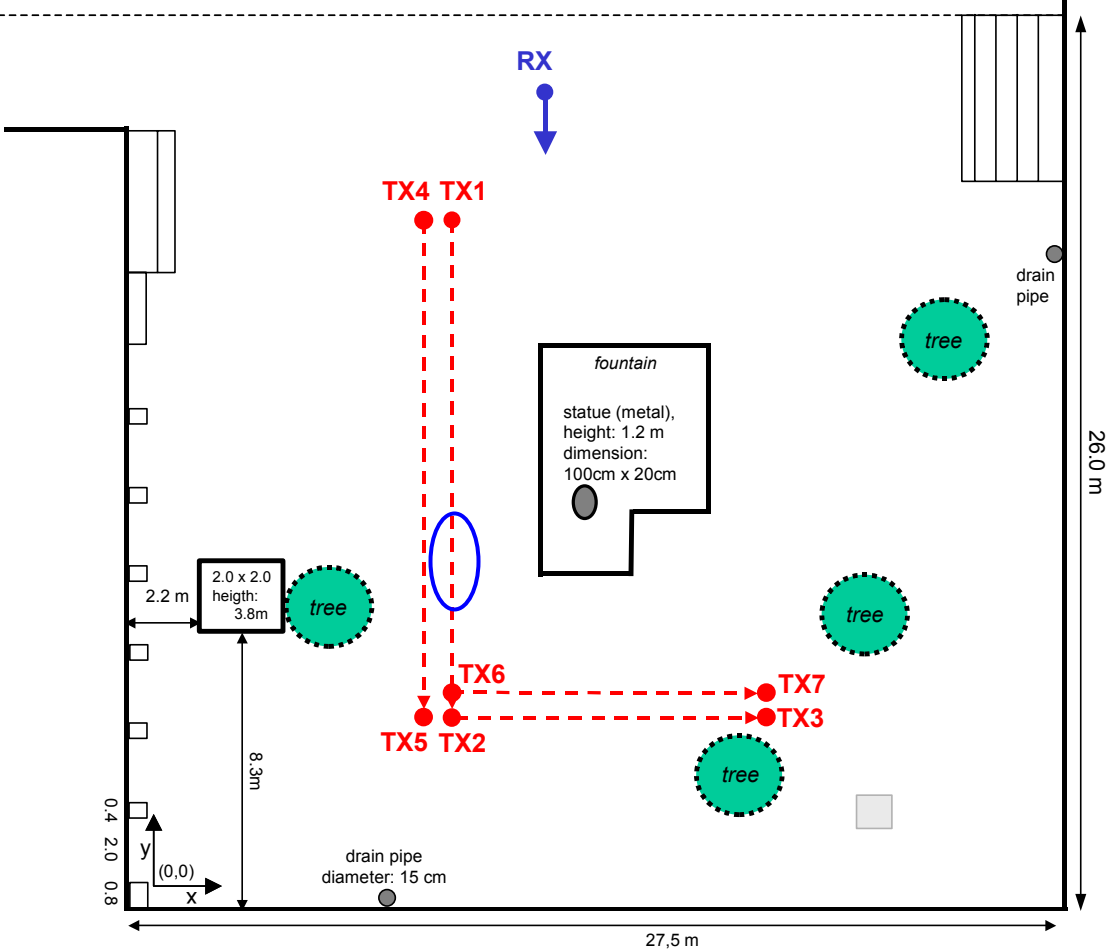
Markus Landmann, Andreas Richter, Reiner S. Thomä
(COST273 TD(02) 132, Lisbon, Portugal, Sep. 2002)

Photograph and sketch of the measurement environment:

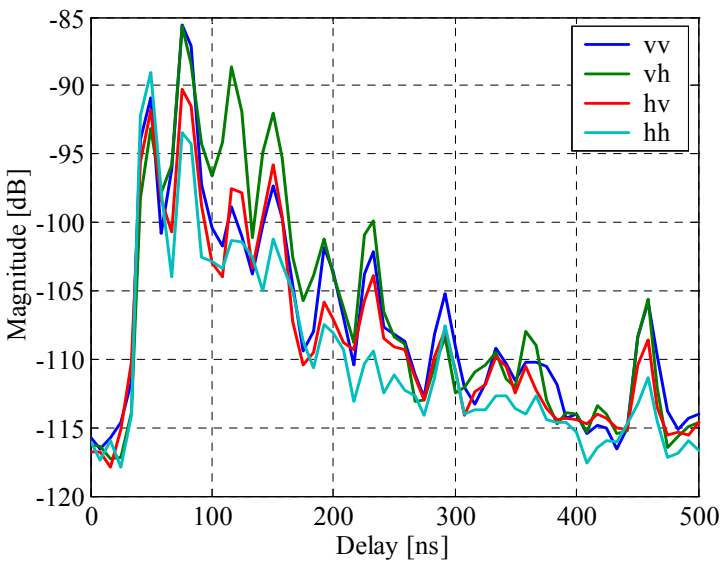


The receive array looks towards the Tx track leading from TX1 to TX2 under LOS conditions.

The sample data cover a distance of about 20λ with a snapshot spacing of 0.4λ (encircled in blue).

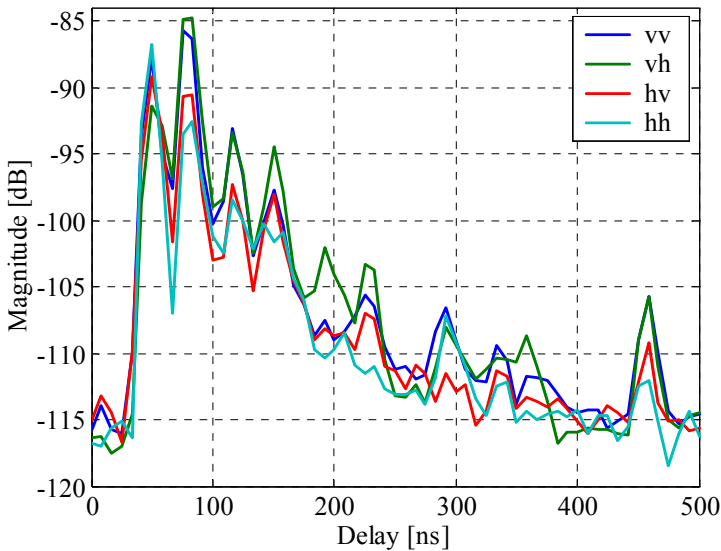


Selected data view:



Delay spectrum 1: single snapshot for all polarization components averaged over all Rx antenna channels.

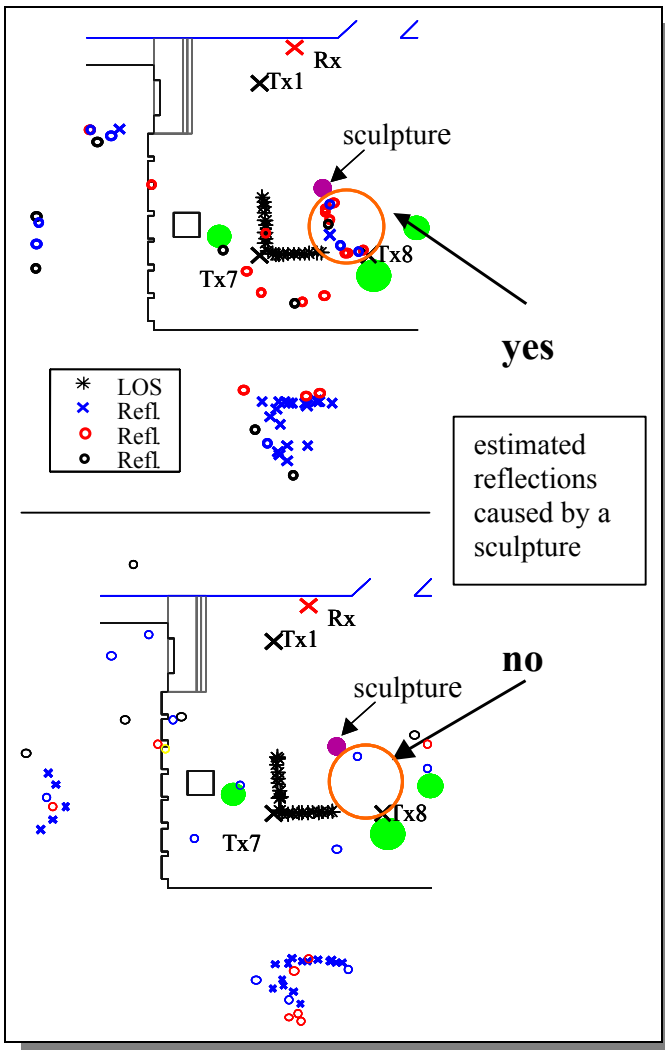
Note the component at 110 ns which is very strong only in the vh cross polarization.



Delay spectrum 2: single snapshot for all polarization components averaged over all Rx antenna channels.

Note the component at 110 ns which is equally strong in the vv and the vh polarizations. The distance between the 2 delay spectra is only a few wavelengths.

Advanced parameter estimation results:



Joint 2dimensional superresolution parameter estimation by SAGE + gradient based Maximum-Likelihood (see COST 273 TD(02) 132)

The strongest multipath components are shown in a map according to the estimated azimuth of arrival and the path delay.

For the upper figure joint estimation of vertically and horizontally polarized path components has been performed.

For the lower figure, only the vertical polarization has been used. Due to significant polarization changes at the metal sculpture, these reflections cannot be detected by using vertical polarization only.

Measurement file remarks:

- No array calibration
- No phase alignment to compensate the temporal offset between capturing the individual antenna channels (cf. [time diagram](#))
- Filename: <http://www.channelsounder.de/downloads/polmimo1.zip>
- Ordering of the polarization ports: all vertically polarized elements first