MOBILE VCE

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Wideband Channel Characterisation for Body and Personal Area Networks

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Overview

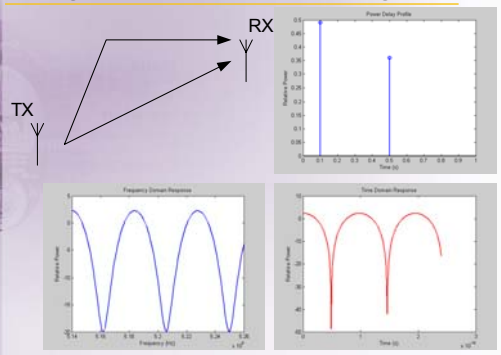
- **Background**
  - Radio wave propagation
- **Measurement Campaign**
  - Aims
  - Methodology
  - Main Results
- **Conclusions**
- **Questions**

Background

- **Personal Area Networks (PANs)**
- **Body Area Networks (BANs)**

- **Mobile VCE Core 3 Programme**
  - Vision: Interworking of Mobile Communications and Broadcasting networks
  - Wireless Enablers:
    - Multimode terminals
    - Intra-PAN communication technologies

Background - Radio Wave Propagation



Background – Radio Wave Propagation

- **RMS Delay Spread:**
  - Root Mean Square of power weighted time delays
  - Measure for the time dispersion in the channel
- **Ricean K – Factor:**
  - Ratio of power in dominating multipath component to power in other multipath components
  - Measure for the frequency selectivity of the channel

Measurement Aims

- **Collect appropriate channel data for the evaluation of candidate waveforms**
- **Comparison of channel characteristics between frequency bands, environments and antenna positions**
- **Influence of user actions on channel characteristics**

Measurement Plan

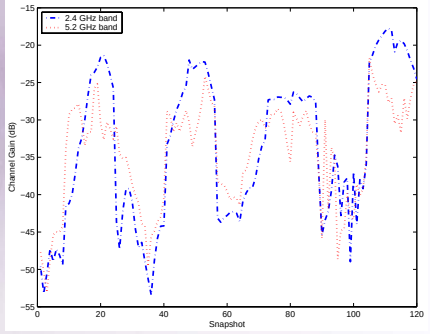
- **Antenna positions**
  - On-body
  - Nearby-peer
- **Variety of indoor measurement locations**
- **Variety of user actions**

Measurement Methodology

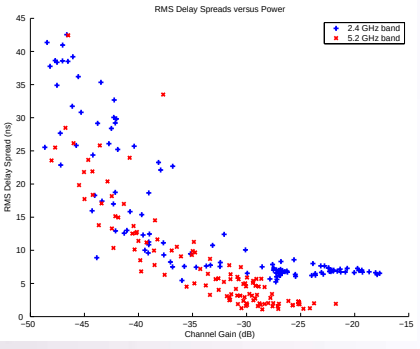
- Vector Network Analyser
- Ultra-Wide Band Antennas
- Post-processing:
  - Power Delay Profiles,
  - RMS Delay Spread,
  - Ricean K-Factor

Measurement

Measurement Results



Measurement Results



Conclusions

- **Characteristics of link depend on presence of obstruction by the body:**
  - Line-Of-Sight
    - Dominates if present
  - Non-Line-Of-Sight:
    - Link dependent on multipath in environment
    - Shadow depths reaching -30 to -40dB
  - Observed in all frequency bands
- **Further work concentrates on system development to deal with body obstruction**

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Thank you !

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