Project: IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)

Submission Title: Thoughts on Channel Realizations

Date Submitted: 21 January 2016 **Source:** Alexander Fricke, TU Braunschweig

E-Mail: fricke@ifn.ing.tu-bs.de

Re: n/a

Abstract: Basis for the discussion on how to include a set of concrete channel realizations to the channel model and the CMD.

Purpose: Contribution towards finalizing the channel modeling document of TG3d

Notice: This document has been prepared to assist the IEEE P802.15. It is offered as a basis for discussion and is not binding on the contributing individual(s) or organization(s). The material in this document is subject to change in form and content after further study. The contributor(s) reserve(s) the right to add, amend or withdraw material contained herein.

Release: The contributor acknowledges and accepts that this contribution becomes the property of IEEE and may be made publicly available by P802.15.

Thoughts on Channel Realizations

Alexander Fricke, TU Braunschweig

Frequency Band (1)

• A channel impulse response (CIR) depends on the bandwidth of the underlying signal



- Do we have to define frequency bands?
- Data Center / Intra-Device models output channel transfer functions (CTF)
 → via IFFT, any CIR in any (sub-) band of the

envisaged 252 GHz – 325 GHz range can be evaluated

• OK for the Close-Proximity P2P model?

Frequency Band (2)

- Proposal: Inclusion of a set of channel transfer functions (CTFs) rather than channel impulse responses (CIRs)
- System proposals have to be tested against the CIRs that are generated from these CTFs according to the frequency bands defined in the proposals
- Advantages:
 - Method covers the full possible frequency range
 - Allows for system designs using sub-bands
 - \rightarrow Agreed on providing channel transfer functions

January 2016

doc.: IEEE 802.15-16-0127-01-003d_thoughts_on_channel_realizations

Composition of the set

- So far, we have agreed upon a number of 100 data sets per application case (P2P, Intra-Device, ...)
- Does it make sense to define sub-sets e.g. 10 mandatory CTFs along with 100 optional ones?
- → Agreed on providing 100 CTFs for optional testing and 10 CTFs for mandatory testing

Generation of a CIR

- Applied filter functions, ..., IFFT parameters must be defined or at least documented for every proposal
- \rightarrow Agreed.
- → The frequency step between bins should be chosen appropriately according to the expected maximum excess delay of the respective scenario

Format

- .mat, .s2p, .csv
 - we should agree
 - → agreed on: ASCII-file with appropriate variable names and indices and comments
- To be embedded in the CMD file or to be stored on a separate webspace
 - where is it hosted?
 - \rightarrow IEEE mentor, embedded in the CMD if possible
 - how is it linked / referenced? → embedded or referenced by doc.number

Thank You for Your Attention