**IEEE P802.15**

**Wireless Personal Area Networks**

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| Title | Simulation Scenarios for the Backhaul/Fronthaul and Wireless Data Center Section in the TG3d CMD |
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| Abstract |  |
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# Introduction

In Sections 6 and 7 of the CMD channel models are described, which depend on assumptions for a couple of parameters. This document proposes concrete parameter values, which should be used for the simulation of the Backhaul/Fronthaul and the Wireless Data Center applications. It is proposed to add the following two sections to the CMD.

# Simulation Scenarios for Wireless Backhaul/Fronthaul

In [6.7] weather conditions in six cities with different climatic conditions are described yielding also different specific attenuations. Table 6.6 lists these weather conditions and the corresponding specific attenuations together with the name of the channel model. The water vapour density is calculated using the online tool provided at [6.8.]

Table 6.6: Definition of Channel Models for Backhaul/Fronthaul [6.6]

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Channel Model Name | Description in [6.7] | Water vapour density[[1]](#footnote-1) [g/m3] | Rain rate [mm/h] | Liquid water density in fog [g/m3] | Liquid water content of a cloud[[2]](#footnote-2) [g/m3] |
| CM-BFH 1 | Bangkok, temperature 35° C, relative humidity 90% | 37.5 | n/a | n/a | n/a |
| CM-BFH 2 | Basra, temperature 43° C, relative humidity 30%, dust (10 m visibility) | 28.2 | n/a | 0.5[[3]](#footnote-3) | n/a |
| CM-BFH 3 | Berkeley, temperature 20° C, relative humidity 60%, fog (100m visibility) | 10.5 | n/a | 0.14[[4]](#footnote-4) | n/a |
| CM-BFH 4 | Bellingham, temperature 22° C, relative humidity 50%, rain (4mm/h) | 9.8 | 4 | n/a | n/a |
| CM-BFH 5 | Boulder, temperature 20° C, relative humidity 44% | 8.6 | n/a | n/a | n/a |
| CM-BFH 6 | Buffalo, temperature -10° C, relative humidity 30% | 0.5 | n/a | n/a | n/a |
| CM-BFH 7h / 7v[[5]](#footnote-5) | Boulder including clouds (100 m of large cumulus clouds[[6]](#footnote-6)), temperture 20° C, relative humidity 44%;  | 8.6 | n/a | n/a | 2.5 |

# Simulation Scenarios for Wireless Data Centers

In table 7.5 the scenarios for the concrete channel models for simulations in Wireless Data Centers are defined.

Table 7.5: Definition of concrete Channel Models for Wireless Data Centers

|  |  |
| --- | --- |
| Channel Model Name | Path Type |
| CM-WDC 1 | Type 1/2, Tx1, LoS |
| CM-WDC 2 | Type 1/2, Tx1, NLoS |
| CM-WDC 3 | Type 1/2, Tx 2, LoS |
| CM-WDC 4 | Type 1/2, Tx 2, NLoS |
| CM-WDC 5 | Type 3, LoS |
| CM-WDC 6 | Type 3, NLoS |

# References

[6.7] M. Rosker,Progress towards a THz imager, IMS 2007, Workshop WFE, “THz Device Characterization and security applications”, 8 June 2007, slide 5.

[6.8] <http://www.ib-rauch.de/bautens/formel/abs_luftfeucht.html> (visited on November 8, 2015)

1. Based on the calculation using [6. 8] [↑](#footnote-ref-1)
2. Based on table 6.5 [↑](#footnote-ref-2)
3. The lower limit for the visibility guven in table 6.4 is 50m. The liquid water density assumed here is for a visibility of 50m. [↑](#footnote-ref-3)
4. By linear interpolation from the values given in table 6.4 [↑](#footnote-ref-4)
5. CM-BFH 7h(7v) channel model for horizontal (vertical) polarization; [↑](#footnote-ref-5)
6. The assumption on clouds is not taken from [6.7] and instead assumed by TG3d in order to have scenario including clouds [↑](#footnote-ref-6)