IEEE P802.11
Wireless LANs

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| HEW Channel Model  |
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HEW channel models consist of outdoor and indoor models which are based on the ITU and TGac channel models, respectively. Both models provide detailed modeling of the spatio-temporal characteristics of the multi-antenna channel.

An additional outdoor device to device path loss model is added for simulations requiring explicit modelling of such cases.

**ITU Channel Models**

The ITU models are fully described in [1]. These models are applicable for up to 100MHz signal BW, 2-6GHz center frequency and outdoor and indoor environments. All models are defined for NLOS and LOS channels with a distance dependent LOS probability as described in [1] Table A1-3.

These models shall be primarily used to evaluate HEW link and system performance for SISO or MIMO links.

The ITU Urban Micro (UMi) shall be used to test outdoor Microcell/Picocell deployments. For deployments that co-locate WLAN in Macro cellular cells the Urban Macro (UMa) channel may be considered.

Plots of the RMS delay spread and LOS probabilities as specified in [1] are shown in the Appendix.

The following two simulation scenarios shall be used to test performance in outdoor scenarios:

1. ITU UMi with 3kmph (for simulations of single user beamforming and MU-MIMO at pedestrian speeds)
2. ITU UMi with 30kmph (for simulations of single user open loop including STBC at low vehicular speeds)

**Indoor MIMO Channel Models**

The indoor channel model for HEW is based on the 802.11ac channel model [2].

**Path Loss Models**

The path loss models for HEW outdoor and indoor scenarios are based on [1] Table A1-2.

The UMi NLOS path loss uses the hexagonal cell layout formula.

Plots for UMi and UMa path loss are shown in the Appendix.

Building penetration loss of 14/17dB mean and 7dB standard deviation shall be added when simulating indoor reception with outdoor access points or vice versa at 2.4/5 GHz center frequencies, respectively.

**Outdoor Device to Device Path Loss Model**

Path loss for on the ground outdoor device to outoodr device shall use:

1. For LOS the ITU UMi LOS path loss model with =1.8m.
2. For NLOS the ITU UMi NLOS hexagonal cell layout plus 5dB (path loss increases).

**References**

[1] Report ITU-R M.2135-1 (12/2009) Guidelines for evaluation of radio interface technologies for IMT Advanced

[2] TGac Channel Model Addendum - IEEE 802.11-09/308r12

**Appendix**

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