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 Pico deployments. For deployments that co-locate WLAN in Macro cellular cells the Urban Macro (UMa) channel shall be used.

For indoor simulations the indoor hotspot (InH) may be used in lieu of TGac models.

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 15/20 dB shall be added when simulating indoor reception with outdoor access points or vice versa at 2.4/5GHz 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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