Tapped Delay Line Channel Model for Link-Level Simulations

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Base Document:
C80216j-06_058:" Tapped Delay Line Channel Model and Parameter Settings for Link-Level 802.16 Simulations"
Purpose:
For approval and submission to IEEE 802.16j for system evaluation methodology

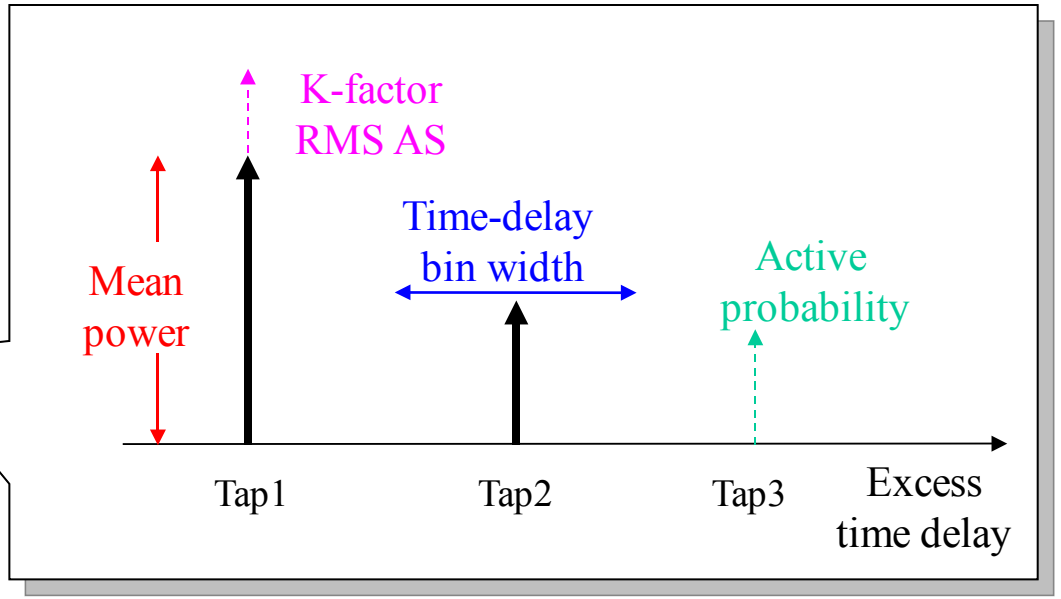
Introduction

- This document provides a Tapped Delay Line (TDL) channel model for link-level 802.16 simulations.
- The model is optimized for mesh and relay links in an urban scenario.
- Radio channel parameters are provided for 5MHz and 10MHz bandwidths at 2GHz and 5GHz band for a wide variety of link types.
- The include: basestation to relay-station, basestation to mobile-station, relay-station to relay-station, relay-station to mobile-station, and mobile-station to mobile-station.

TDL Model structure

- The TDL model is similar in structure to the SUI model.
- Each tap is defined via its relative delay, mean power, K-factor, RMS Azimuth Spread and activity factor.

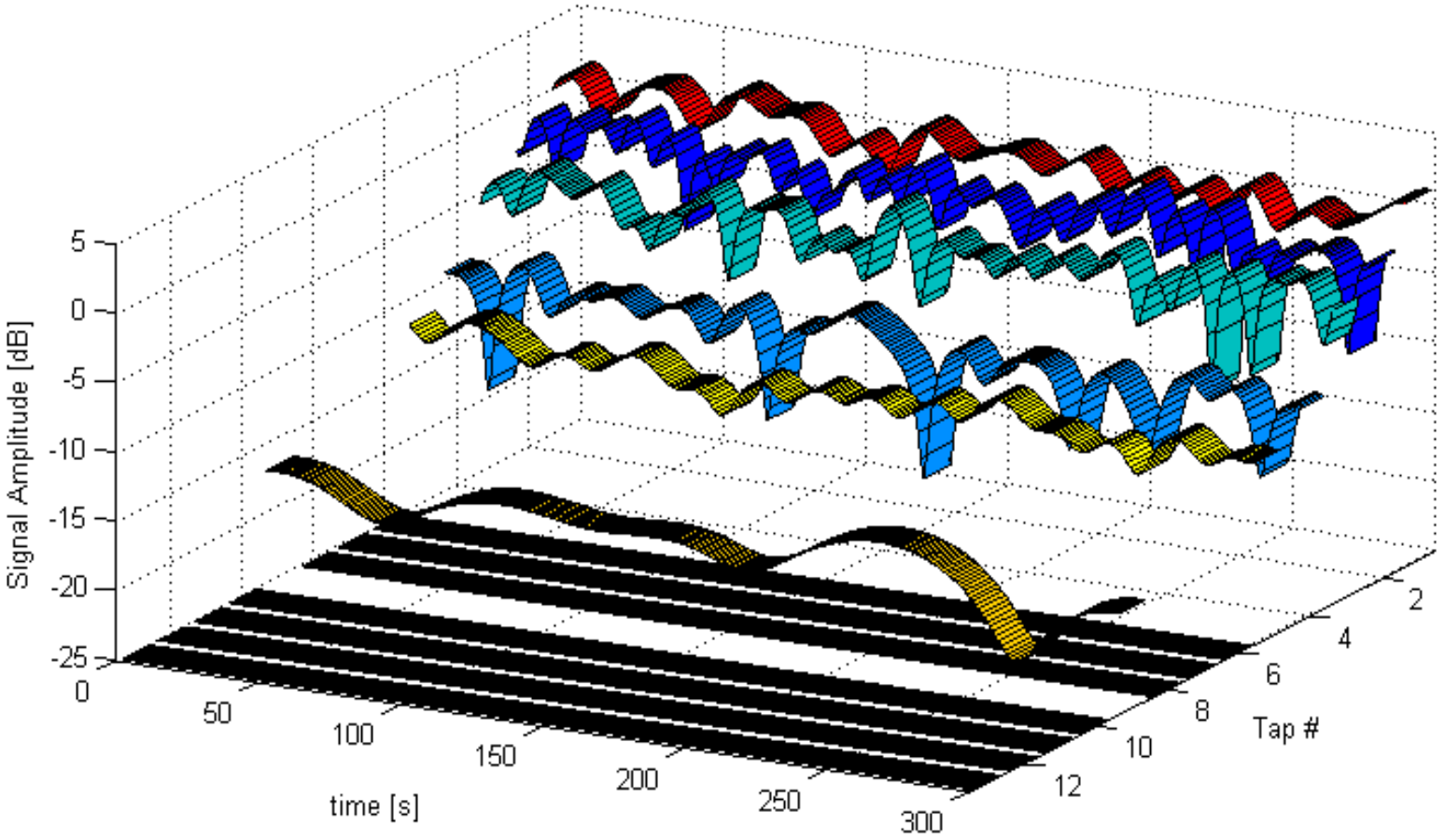
RMS Delay Spread	Probability %	TDL
50 ns	10	
150 ns	30	
⋮	⋮	



TDL Model Parameters

- The TDL parameters were extracted from over 3 Gbytes of point-to-point channel data (obtained using a validated ray model in the centre of Bristol).
- Model parameters for 5MHz and 10MHz operating bandwidths at 2GHz and 5GHz band have been generated
- Data is provided for mobile-to-mobile, mobile-to-relay and relay-to-basestation links (plus all other combinations).
- Similar data is not available in the open literature.
- The submitted document (C80216j-06_058) provides further information that covers:
  - The model structure;
  - The method used to derive the operating parameters;
  - The method of implementation;
  - The detailed parameters for a wide range of models

Example of Time Varying TDL



RS-MS NLoS channel, *Fc* = 2GHz, *Wc* = 10MHz

Path Loss models

- To complete the channel modelling process, a range of path loss models are also available. This work was performed as part of the European Union IST Romantik project and is described in the references of C80216j-06_058.
- Path loss models have been generated for LoS and NLoS urban peer to peer links from the 3Gbyte data set.
- A distant dependent LoS probability function is provided (a key component of the path loss model).
- The models are available for mobile-to-mobile, mobile-to-relay and relay-to-basestation (plus all other combinations).

Summary

- A TDL channel model for link-level simulation has been proposed for use in the 802.16j standardization process.
- A range of path loss models have been developed to support the system level modelling process.
- A Matlab reference model will be produced for distribution at the next group meeting (if sufficient interest exists).