

Channel models for long range deployment

Document Number:

IEEE 802.16.3p-01/76

Date Submitted:

2001-07-09

Source:

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Venue:

Portland, July 2001

Base Document:

IEEE 802.16.3c-01/76) and URL <http://iee802.org/16/tg3/docs/802163c-01_76.pdf>.]

Purpose:

Suggest extrapolation of the channel models to 30km cells

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Extension of Channel Models to 30km Range Cells

- ¥ Purpose: adjust the existing models for 30km range cells
- ¥ Based on formulation and numbers of IEEE 802.16.3c-01/29r2
- ¥ Changed: τ_{rms} , K-factor
- ¥ Not modified: Path loss models, Doppler, Gain Reduction Factors

Expressions for Delay Spread and K-factor

$$\tau_{rms} = T_1 d^\varepsilon \mathbf{y} \implies \tau_{rms}(30km) = \tau_{rms}(7km) \left(\frac{30}{7} \right)^\varepsilon$$

$$\mathbf{K} = F_s F_h F_b K_o d^\gamma \implies K(30km) = K(7km) \left(\frac{30}{7} \right)^\gamma$$

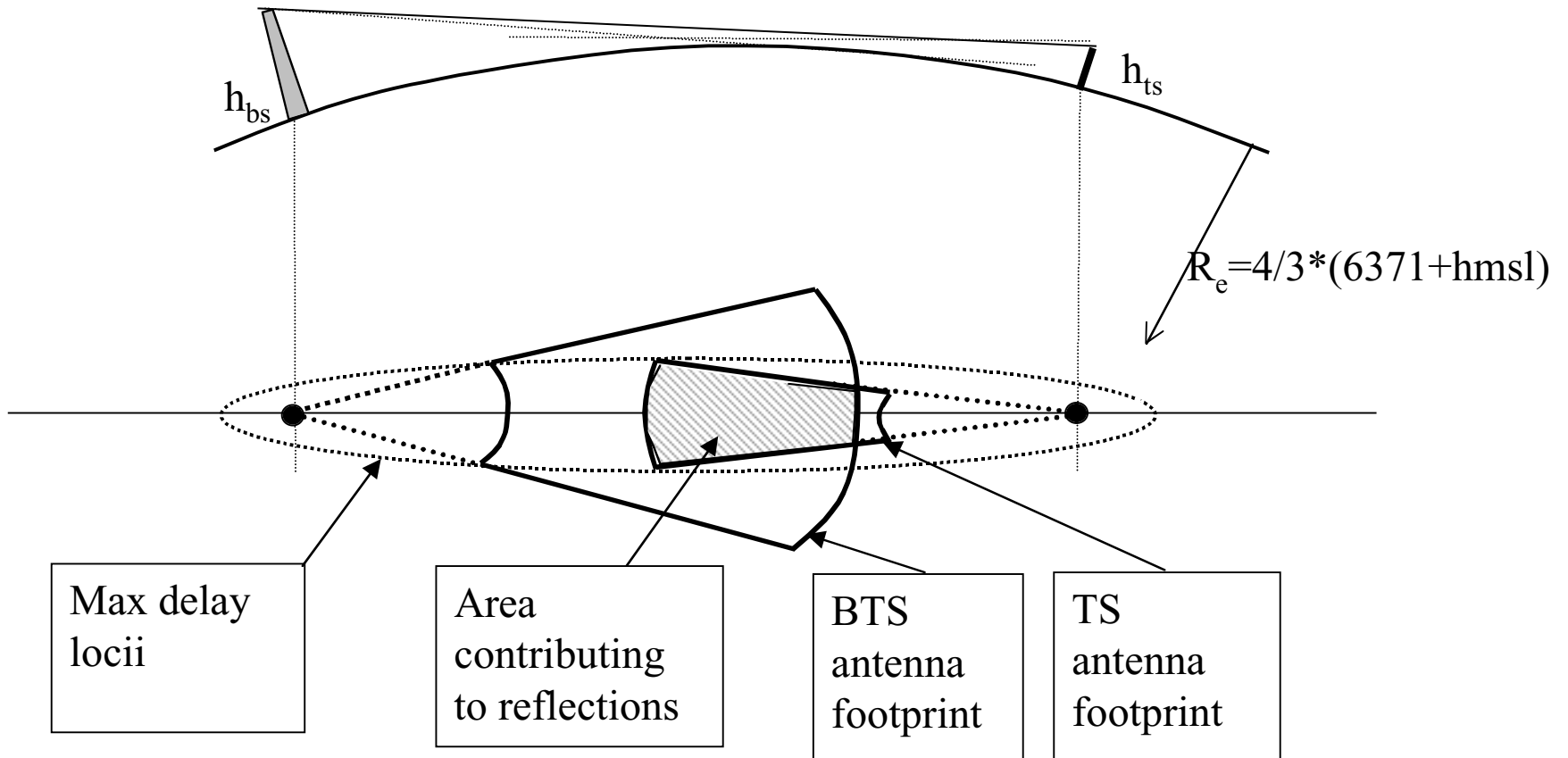
$$\varepsilon = 0.5 - 1 \text{ (0.75 taken)}$$

$$\gamma = -0.5$$

Values for Delay Spread and K-Factors

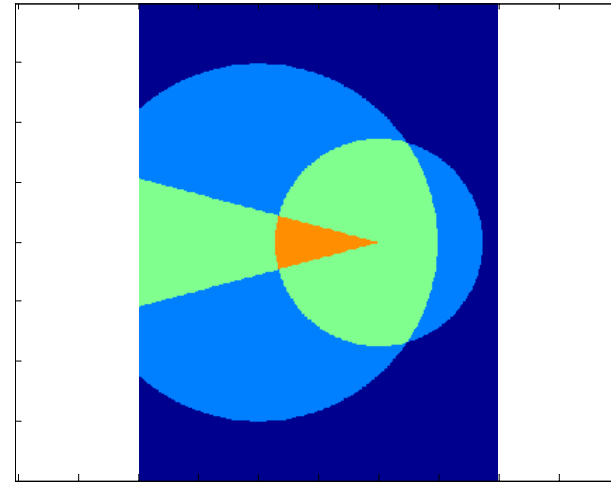
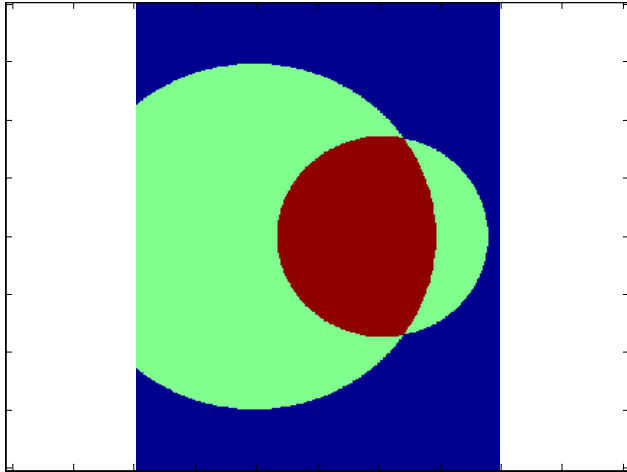
Extrapolated model	τ_{rms} (μs)	K		
		90%	75%	50%
SUI-1, Omni antenna 30° antenna	0.307	1.6	5.02	°
	0.122	6.8	21.4	
SUI-2, Omni antenna 30° antenna	0.596	0.77	2.46	°
	0.226	3.33	10.5	
SUI-3, Omni antenna 30° antenna	0.908	0.24	0.77	°
	0.444	1.06	3.38	
SUI-4, Omni antenna 30° antenna	4.006	0.1	0.29	°
	2.017	0.48	1.55	
SUI-5, Omni antenna 30° antenna	9.094	0.05	0.14	0.46
	4.447	0.19	0.63	2.0
SUI-6, Omni antenna 30° antenna	15.608	0.05	0.14	0.46
	7.059	0.19	0.63	2.0

Effects of the Horizon

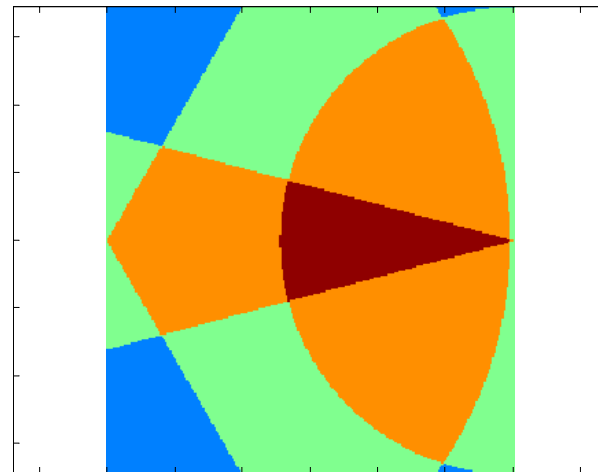


Geometries

BS Omni



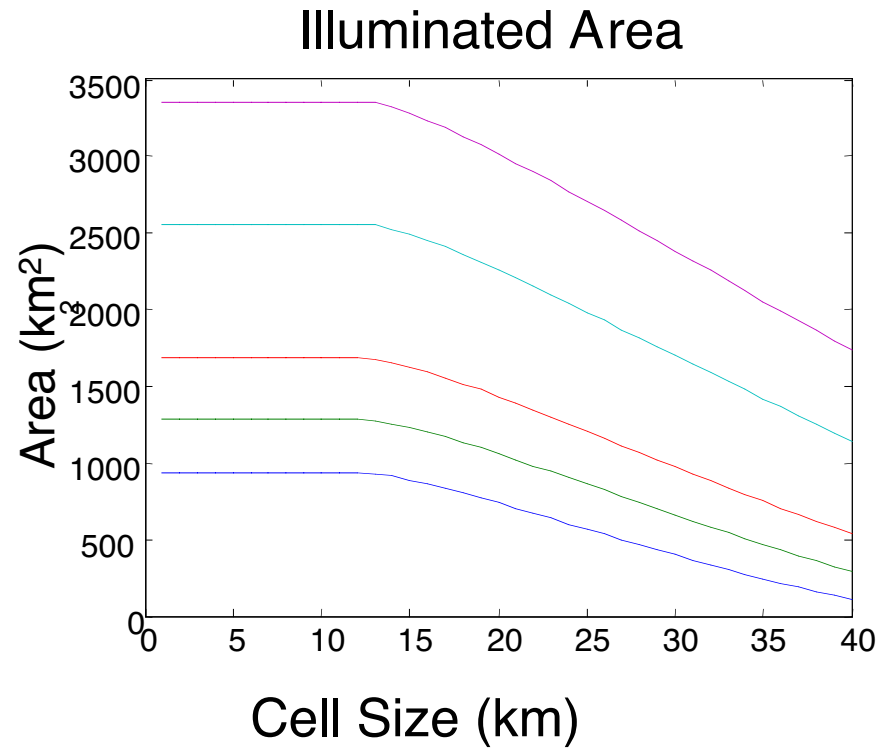
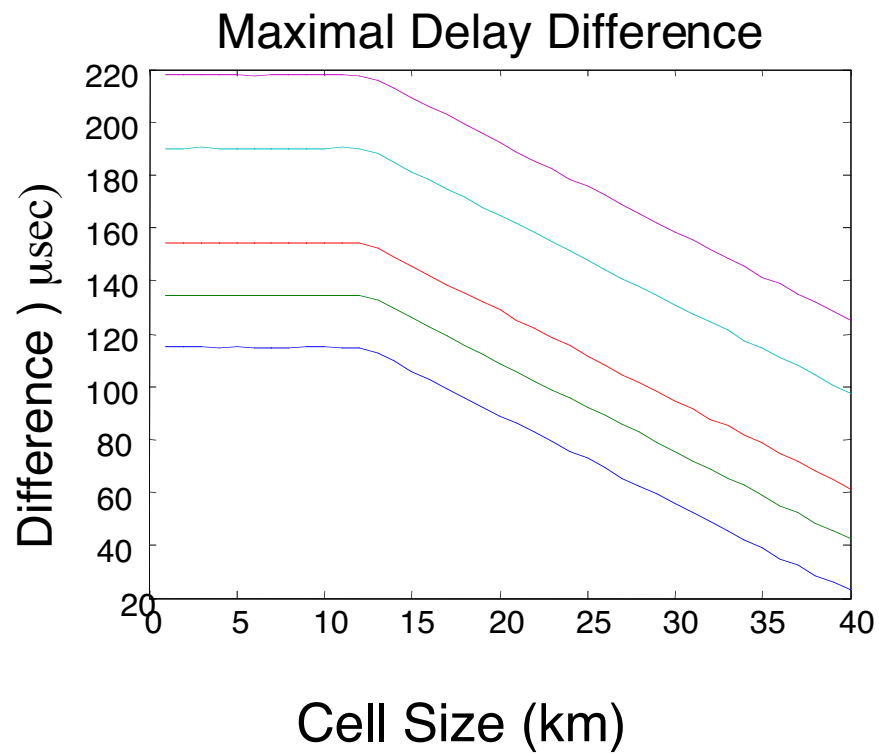
BS Directional



TS Omni

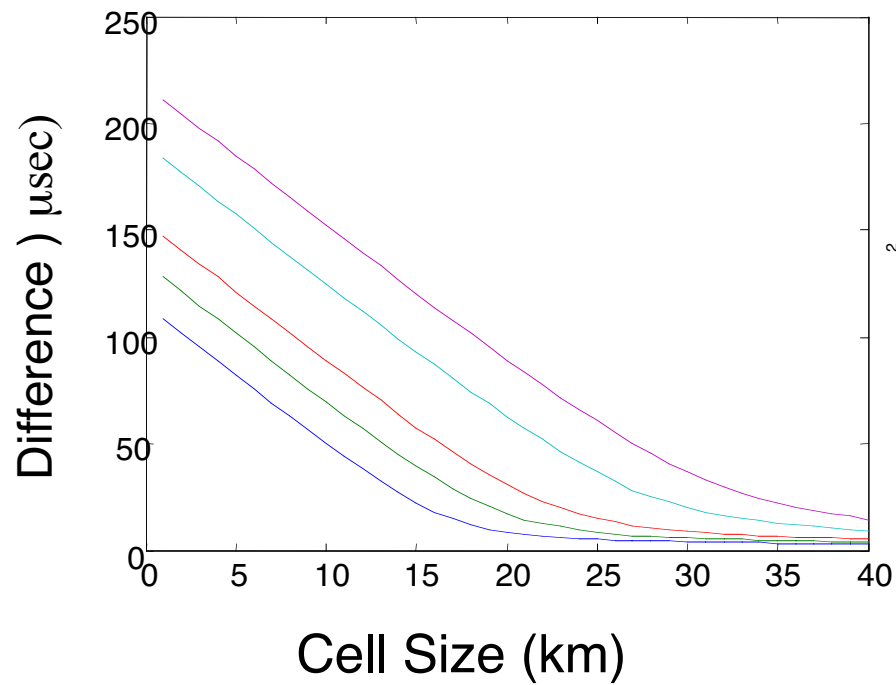
TS Directional

Omni- Omni

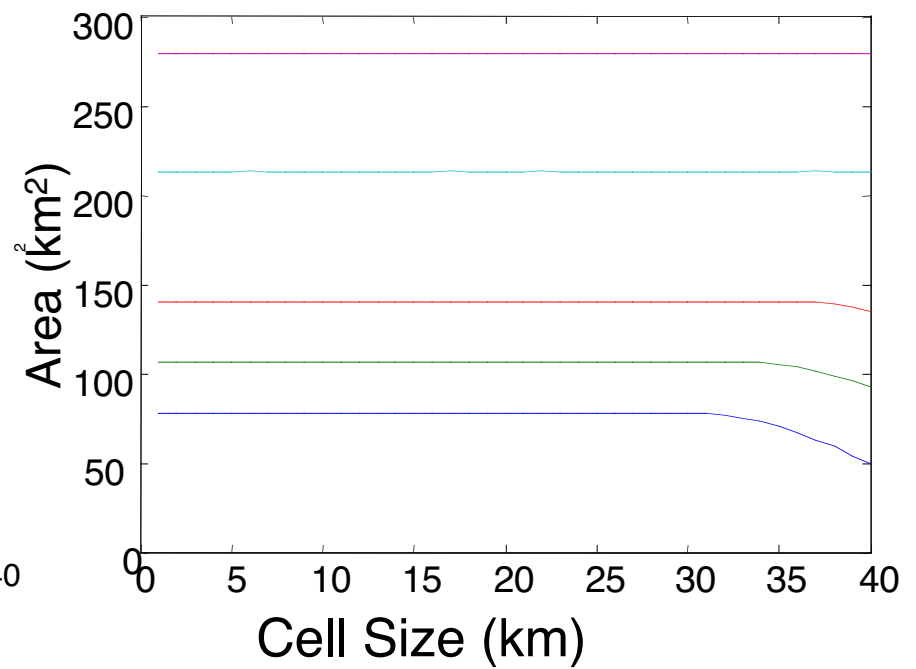


Omni - Directional

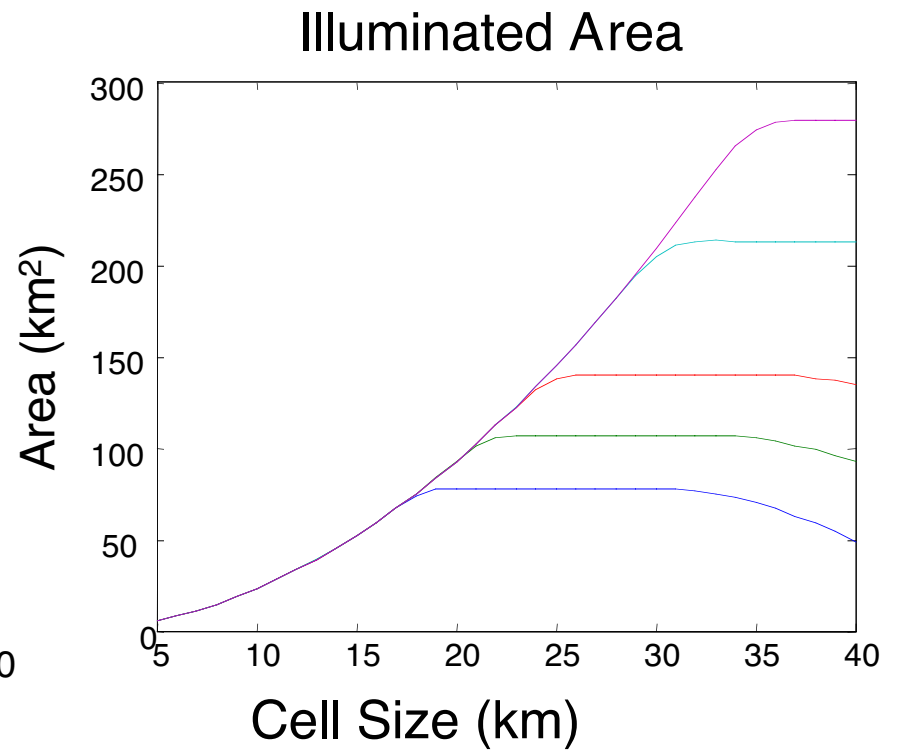
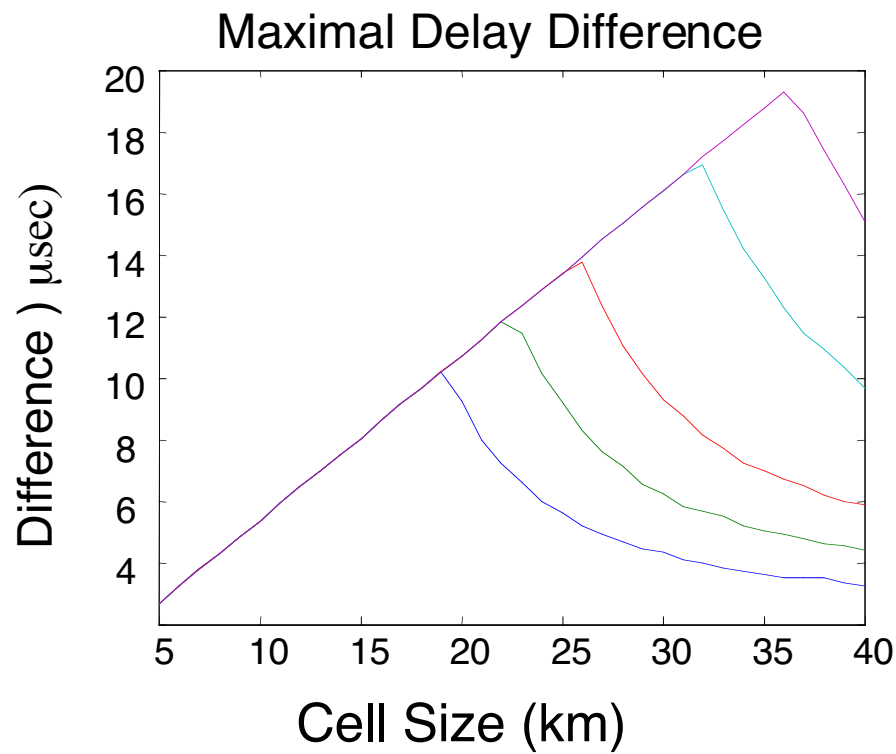
Maximal Delay Difference



Illuminated Area



Directional - Directional



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