

Project: IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)

Submission Title: [Proposed antenna reference models for each Usage Model Definition]

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Abstract: [This contribution describes antenna reference model for each Usage Model Definition]

Purpose: [Contribution to mmW TG3c meeting.]

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Proposed antenna reference models for each Usage Model Definition

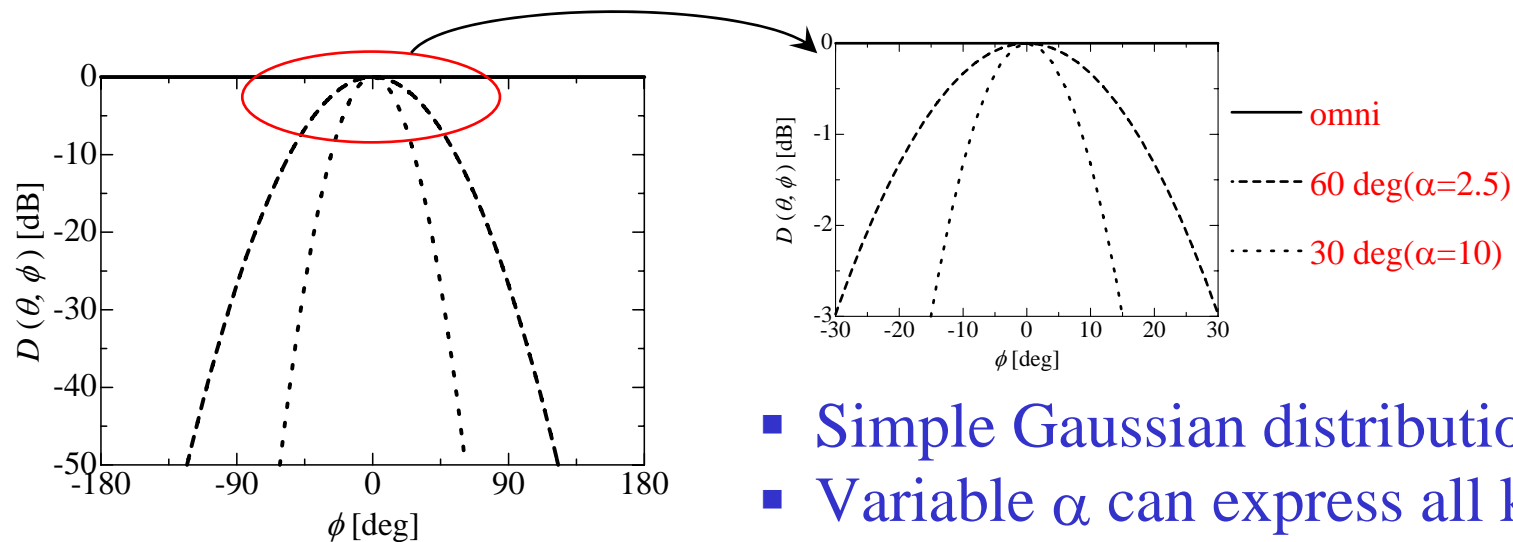
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Basic reference antenna model

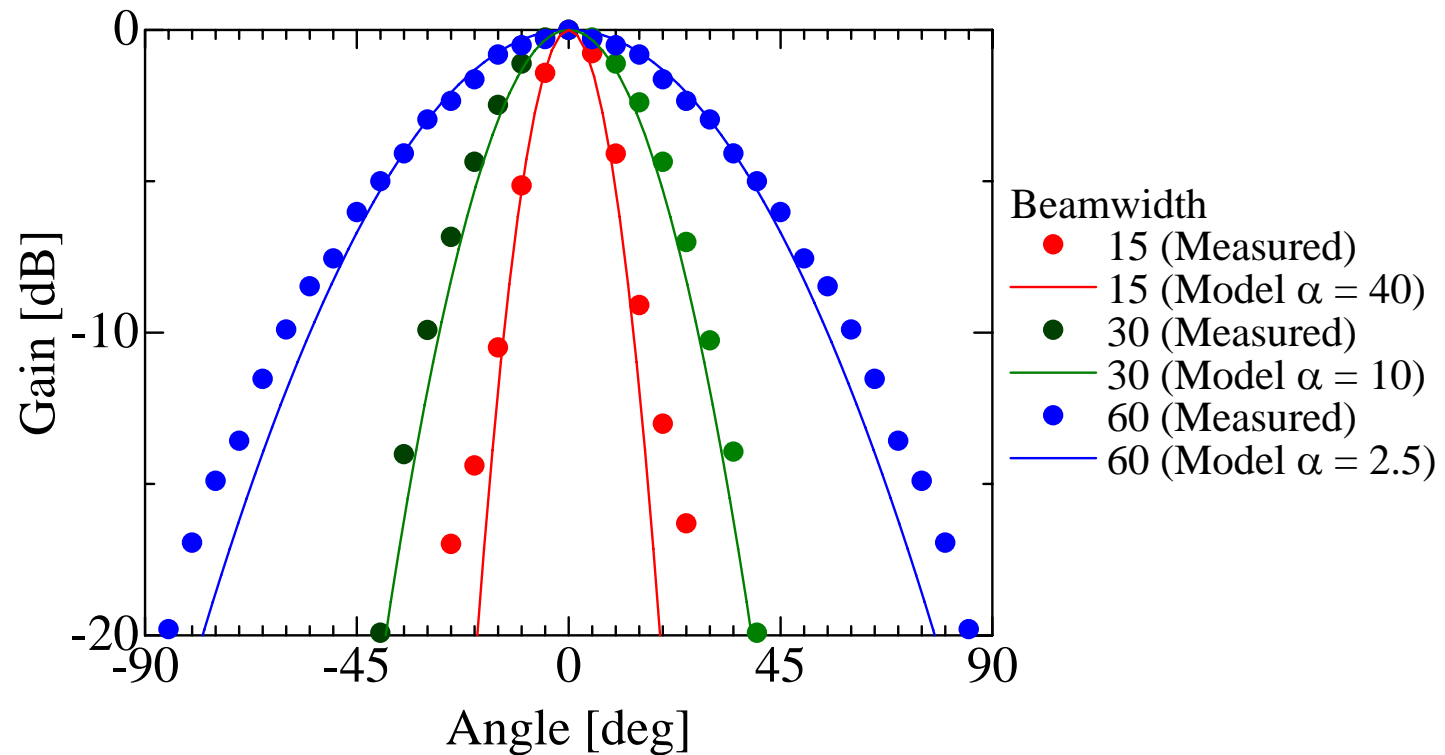
Antenna gain: $G_r(\theta, \phi) = G D(\theta, \phi)$

- Omni directional antenna: $D(0, \phi) = 1$
- Directional antenna: $D(0, \phi) = \exp(-\alpha \phi^2)$



- Simple Gaussian distribution
- Variable α can express all kinds of beam-width

Fitting results of antenna patterns



Gaussian distribution well agree with actual antenna pattern

Proposed reference parameters for each UMD

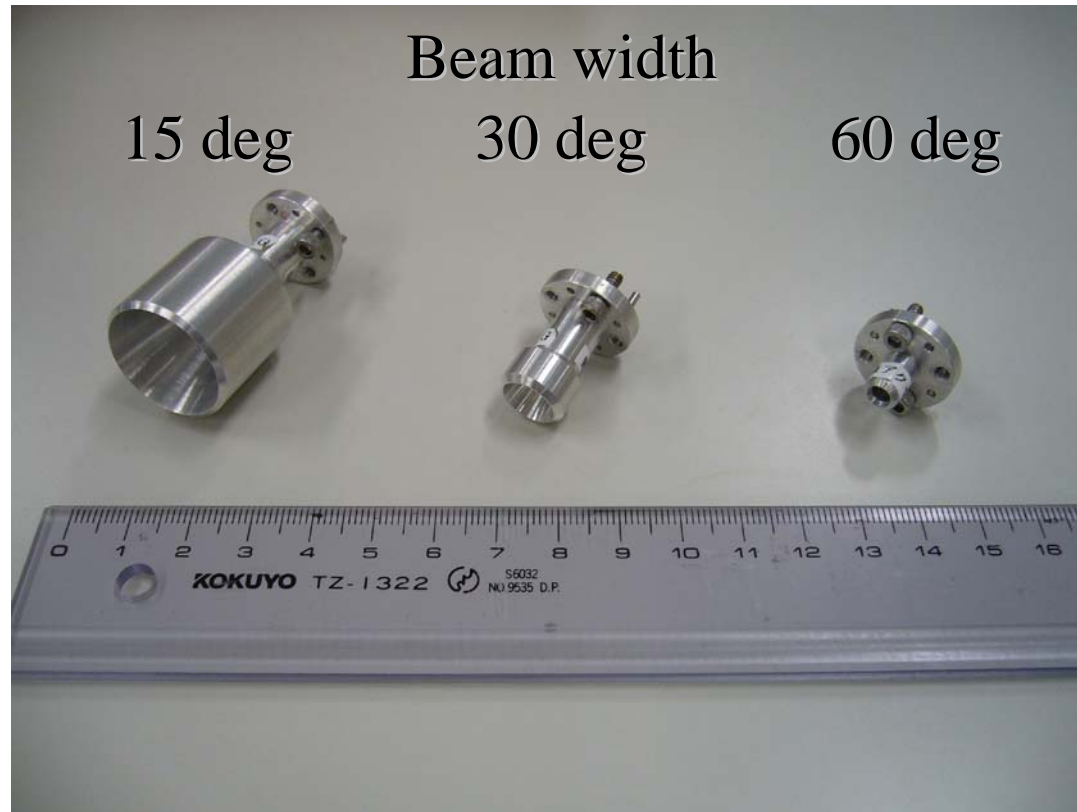
	Devices	Antenna beam-width factor (α)	Correspondent 3-dB beam-width [deg]	Maximum antenna gain [dBi]	Form factor [mm]※1	Bandwidth [GHz]
UM1	TV	40	15	22	20 × 40	16 [59-75 GHz]
	STB	40	15	22	20 × 40	
UM2	TV	40	15	22	20 × 40	
	STB	40	15	22	20 × 40	
UM3	PC	2.5	60	10	4 × 1	
	Peripheral	2.5	60	10	4 × 1	
	TV	40	15	22	20 × 40	
UM4	PC	2.5	60	10	4 × 1	
	Wireless bridge	2.5	60	10	4 × 1	
	TV	40	15	22	20 × 40	
UM5	Server(STB)	2.5	60	10	4 × 1	
	PDA	10	30	16	10 × 10	

※1: Conical horn antenna: Diameter × Length

Policy used in selecting antenna parameters

- The reference antenna should be selected from the antennas used to create the channel model
- The same type of device is assumed to use the same type antenna over all usage models
- The antenna beam width should be practically reasonable

Appendix: Conical horn antennas



These antennas were used in channel measurement