

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

Submission Title: [IEEE802.15.4k LECIM Co-existence Study]

Date Submitted: [March, 2012]

Source: [Kyungsup Kwak, Jaedoo Huh*, M. Al Ameen, Yongnu Jin, Hong W. Liu]

Company: [Inha University, *ETRI]

Address [428 Hi-Tech, Inha University, 253 Yonghyun-dong, Nam-gu, Incheon, 402-751, Republic of Korea], [ETRI, 161 Gajeong-dong, Yuseong-gu, Daejeon, 305-700, Republic of Korea]*

Voice: [+82-32-860-7416], FAX: [+82-32-876-7349],

E-Mail: [kskwak@inha.ac.kr]

Re: []

Abstract: [A PHY Proposal for Low Energy Critical Infrastructure Networks Applications]

Purpose: [To be considered in IEEE 802.15.4k]

Notice: This document has been prepared to assist the IEEE P802.15. It is offered as a basis for discussion and is not binding on the contributing individual(s) or organization(s). The material in this document is subject to change in form and content after further study. The contributor(s) reserve(s) the right to add, amend or withdraw material contained herein.

Release: The contributor acknowledges and accepts that this contribution becomes the property of IEEE and may be made publicly available by P802.15.

Contributors

Name	E-mail	Affiliation
Kyung Sup Kwak	kskwak@inha.ac.kr	Inha University
Jaedoo Huh	jdhuh@etri.re.kr	ETRI, Korea
M. Al Ameen	m.ameen@hotmail.com	Inha University
Yongnu Jin	jyn4941@163.com	Inha University
Hong W. Liu	hong.w.liu@hotmail.com	Inha University

IEEE802.15.4k LECIM Coexistence Study

Outline

- Simulation parameters
- Simulation results

Major parameters of coexisting 802 systems in the 2400-2483 MHz

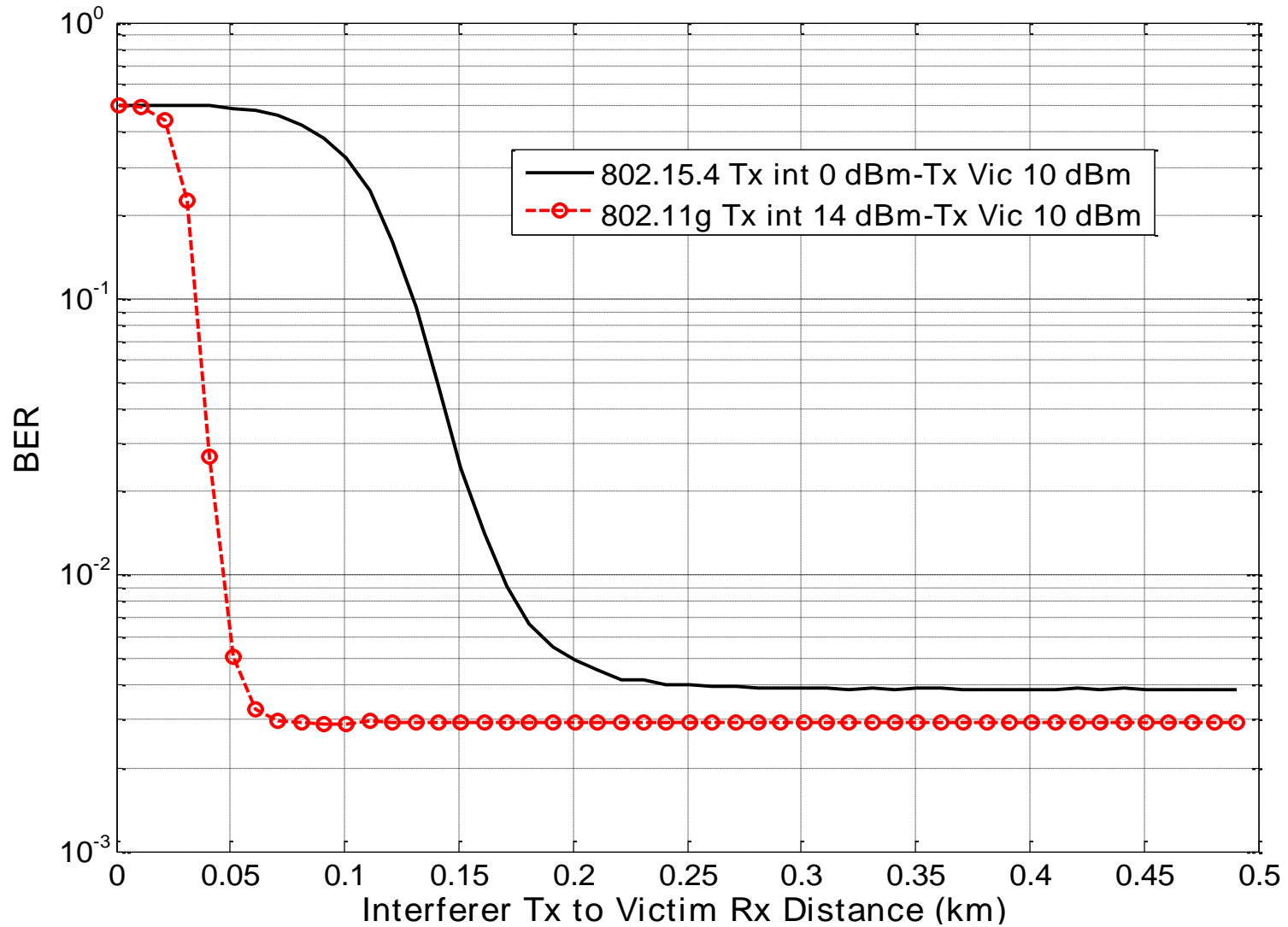
System	PHY Spec	PHY Mode	Channel Bandwidth (MHz)	Transmit Power (dBm)	Receiver Sensitivity (dBm)	Average Frame Length (Octet)
802.11b	DSSS	CCK, 11 Mb/s	22	14	-76	1024
802.11g	OFDM	BPSK, 6 Mb/s	22	14	-88	1000
802.11n	OFDM	QPSK, 18 Mb/s	22	14	-83	4096
802.15.3	FHSS	GFSK, 1 Mb/s	1	0	-70	1024
802.15.4	SC	DQPSK, 22 Mb/s	15	8	-75	1024
802.15.4	DSSS	O-QPSK 2000 kc/s, 250 kb/s	2	0	-85	22
802.15.4f	MSK	MSK, 250 kb/s	0.58-	0	-	-
802.15.4g	MR-FSK	FSK 50 kb/s, h = 1.0	0.2	0	-91	250
	MR-OFDM	QPSK, 100 kb/s OFDM Option 4, MCS3	0.2	0	-103	20
	MR-O-QPSK	QPSK, 2000 kc/s Rate Mode 3	5	0	-90	20

We only consider the impact of interference from [802.15.4](#) and [802.11g](#) systems in the [2400-2483MHz](#) on the 4k system performance.

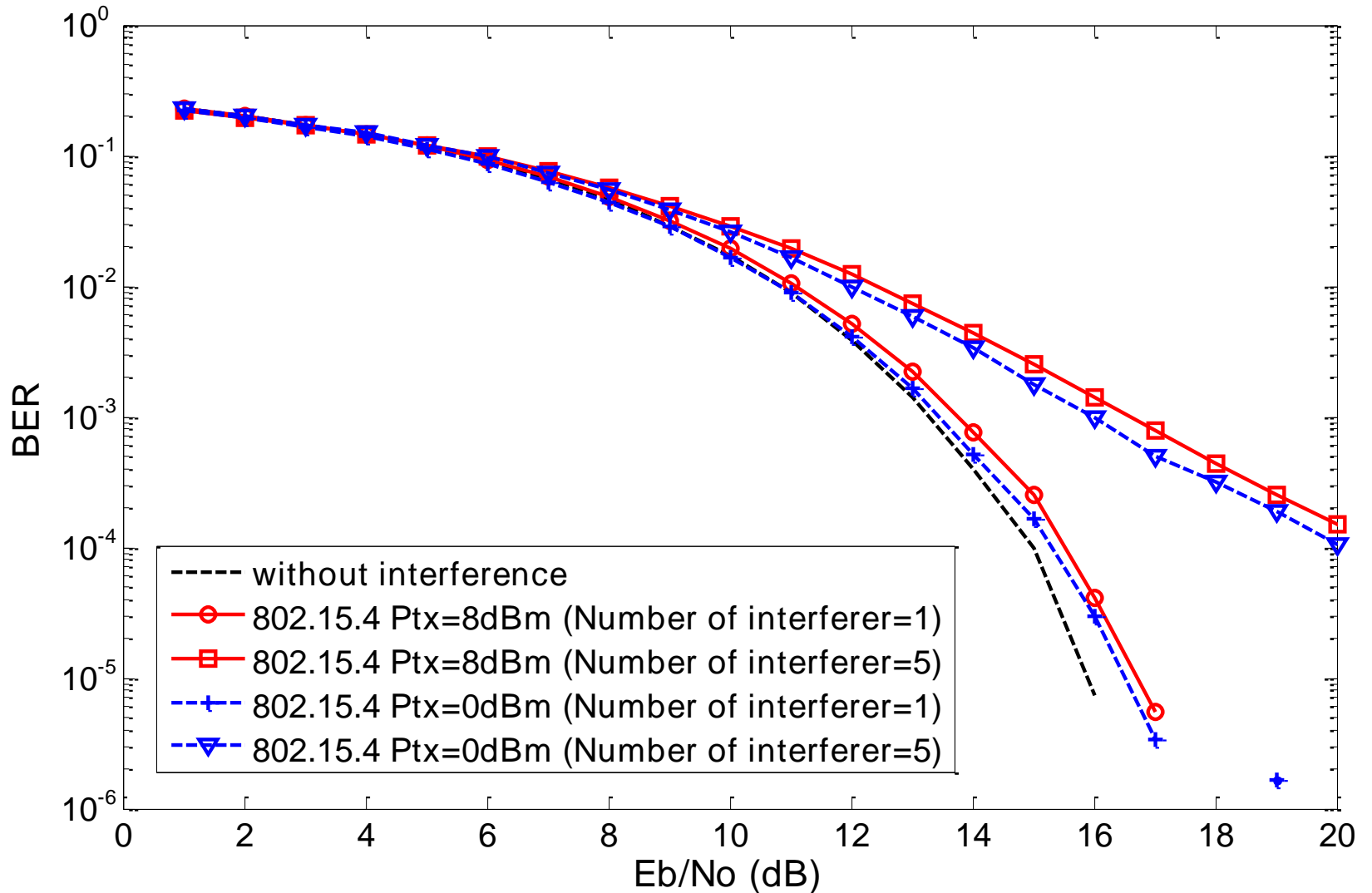
Simulation parameters

- 802.15.4k (under Hata channel model)
 - Tx antenna high 2m and Rx antenna high 30m
 - Distance 1km
 - Transmit power 10dBm
 - Data rate 19.531kbps
 - SF=128
- Interference 802.15.4
 - Tx antenna high 1m and Rx antenna high 1m
 - Distance to Vic Receiver 1-500m
 - Transmit power 0dBm-8dBm
 - Data rate 250kbps
- Interference 802.11g
 - Tx antenna high 1m and Rx antenna high 1m
 - Distance to Vic Receiver 1-500m
 - Transmit power 14 dBm
 - Data rate 6Mbps

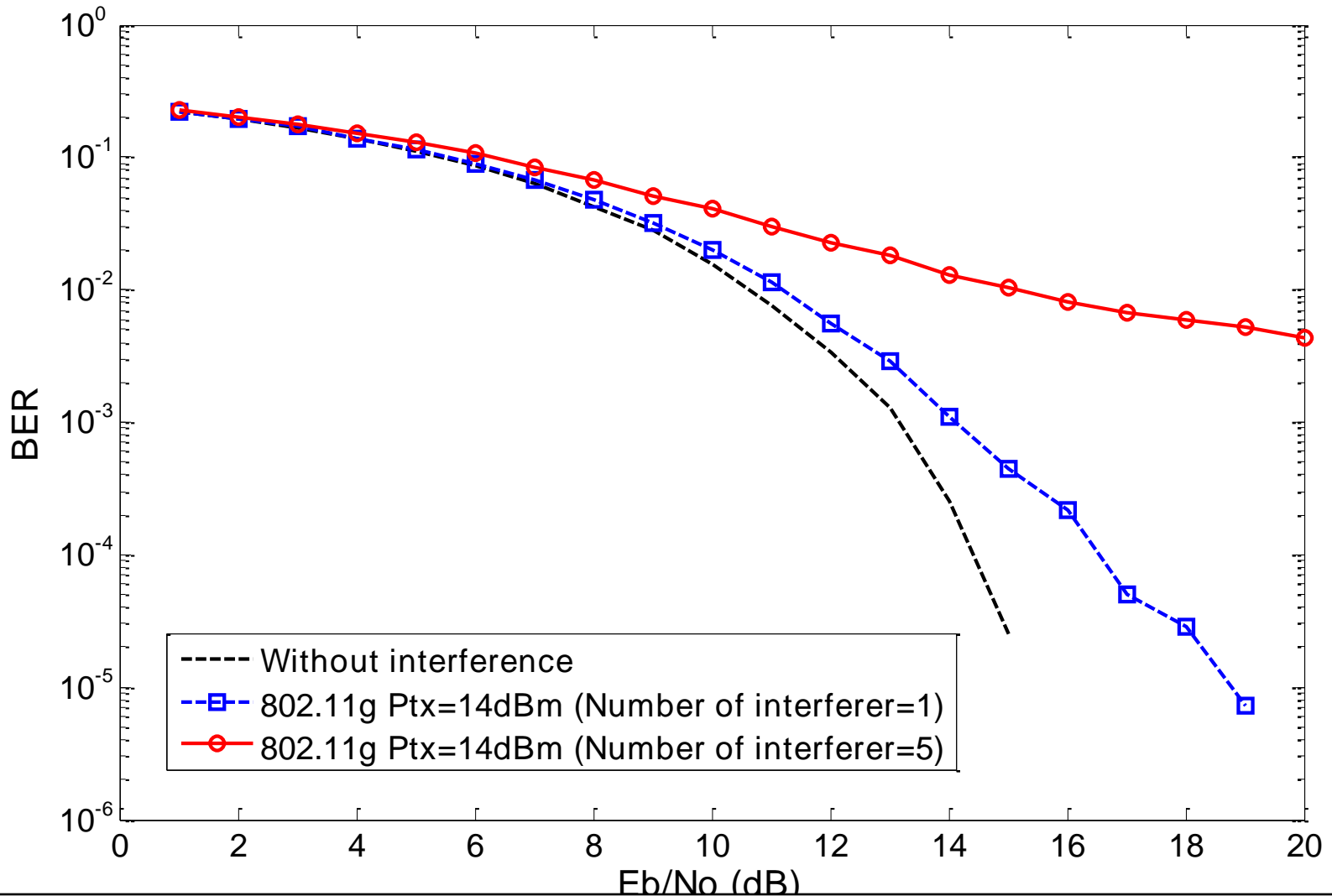
Interferer:802.15.4 and 802.11g; Victim:802.15.4k (SNR=12dB)



Interferer:802.15.4; Victim:802.15.4k (distance=200m)



Interferer:802.11g; Victim:802.15.4k (distance=50m)



BER Performance

- needs to be corrected doc 15-12-0314-00-004k-tg4k-coexistence-document.pdf
- BER vs distance of victim Rx
- The following figures need to be discussed for results
- Fig 6, 7, 9, 10, 12, 13, 14, 15,16, 19, 20, 21, 22, 23, 25, 26,27,28, 29, 31, 32, 33, 34, 35, 38, 39, 40, 42, 43, 44, 45, 46, 47

Thank You