

May 1999 doc.: IEEE 802.11-99/122

Preamble for HIPERLAN-2

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HIPERLAN-2/MMAC-WATM MAC Frame

dynamic boundary

Broadcast CHannel	Frame control CHannel	User data	downlink	uplink	Random access channel
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dynamic boundary

Preamble	PDU	user burst consisting of n PDUs
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user data

PDU: Protocol Data Unit (54 bytes)

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Detection-Failure and False-Alarm Rates-1

- Auto-Correlation (AC) Receiver Structure
 - Correlation delay $D_{ac} = 16$
 - Moving Average (MAV) window size of AC = 48

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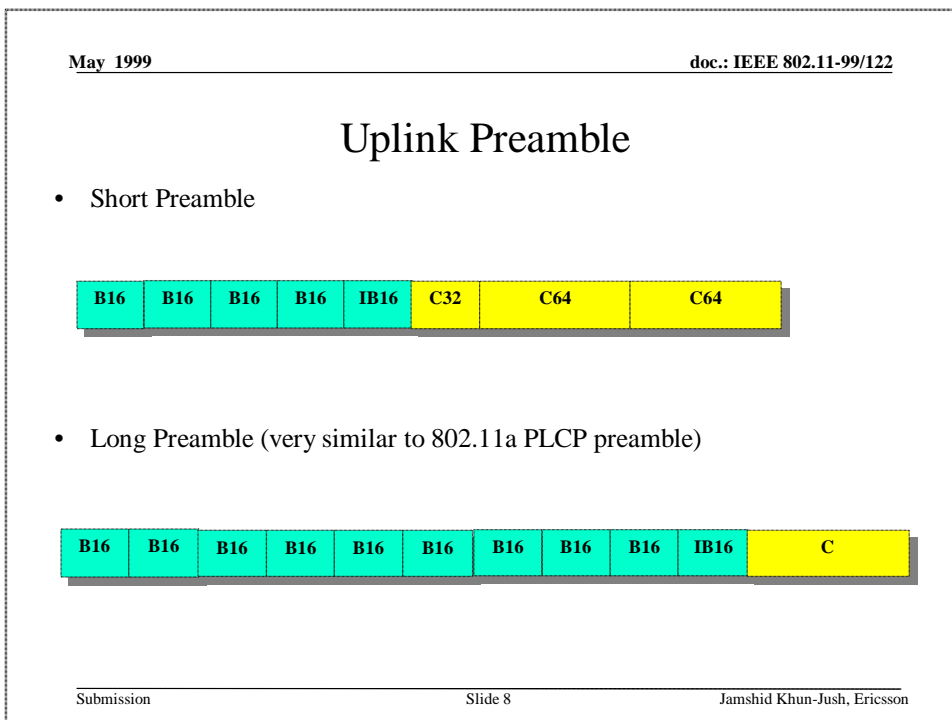
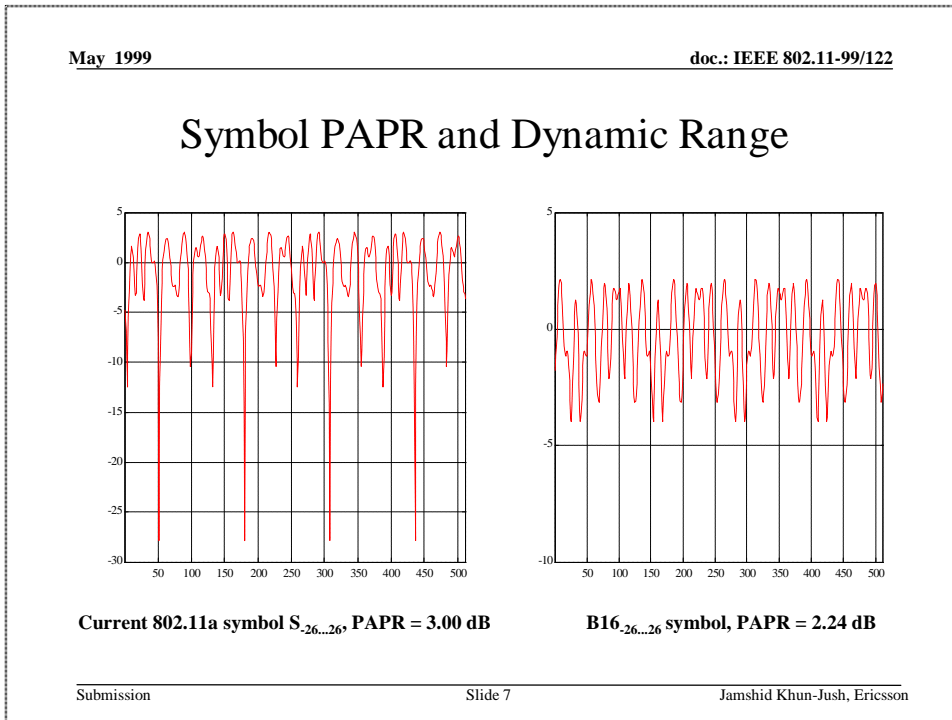
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Detection-Failure and False-Alarm Rates-2

- Detector-1 only takes the absolute value of the A-field correlation peak (as well as the phase at the peak position to verify the peak belonging to the BCH A-field) and compares it with a defined threshold
- Detector-2 takes into account both peaks (A-field and B-field) being above a certain threshold.

Threshold	FA-Det1 [%]	DF-Det1 [%]	FA-Det2 [%]	DF-Det2 [%]
0.35	100	0.1	40	0.1
0.4	100	0.1	10	0.1
0.45	80	0.1	1	0.1
0.5	40	0.1	0.1	0.1
0.55	10	1	0.1	1
0.6	2	10	0.1	10
0.65	0.2	40	0.1	40

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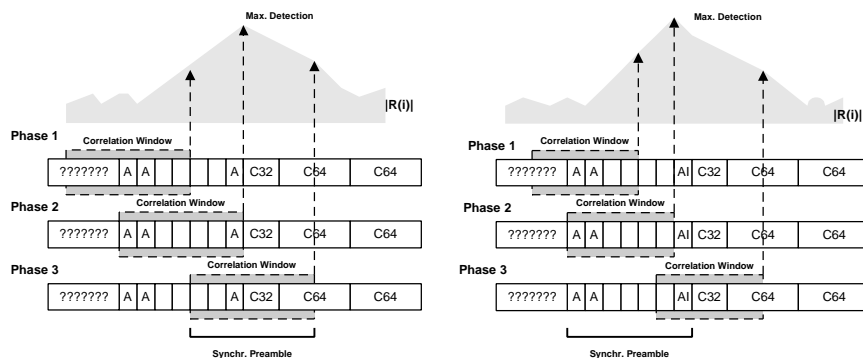


Sign Inversion of the Last Repetition

- Beneficial for
 - *improving timing detection accuracy (sharper auto-correlation peak)*
 - *increasing the receiver implementation flexibility (e.g. auto-correlation based or cross-correlation based)*
 - *providing unique identification possibilities of the last short symbol repetition*

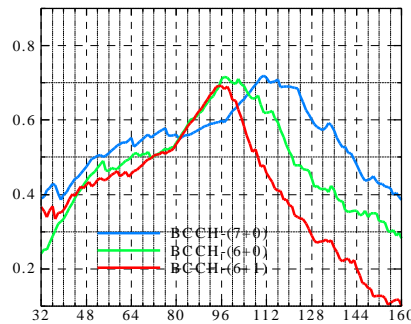
improving timing detection accuracy

- Sharper auto-correlation peak

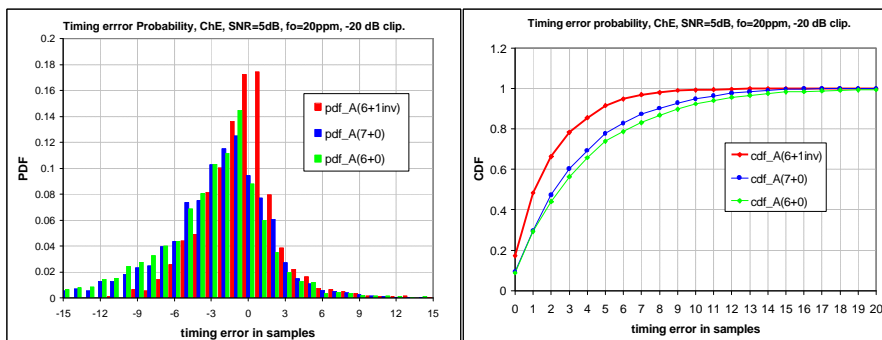


Auto-Correlation Peak

BCCH-(6+0)	A 16	A 16	A 16	A 16	A 16	A 16	C 32	C 64	C 64
BCCH-(6+1)	A 16	A 16	A 16	A 16	A 16	A 16	C 32	C 64	C 64
BCCH-(7+0)	A 16	A 16	A 16	A 16	A 16	A 16	C 32	C 64	C 64



Detection Accuracy



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Cross-Correlation Receiver

A	A	A	A	A	A	A	A	C	C	C
16	16	16	16	16	16	16	16	32	64	64

A	A	A	A	A	A	A	A	C	C	C
16	16	16	16	16	16	16	16	32	64	64

CC-window
CC-window

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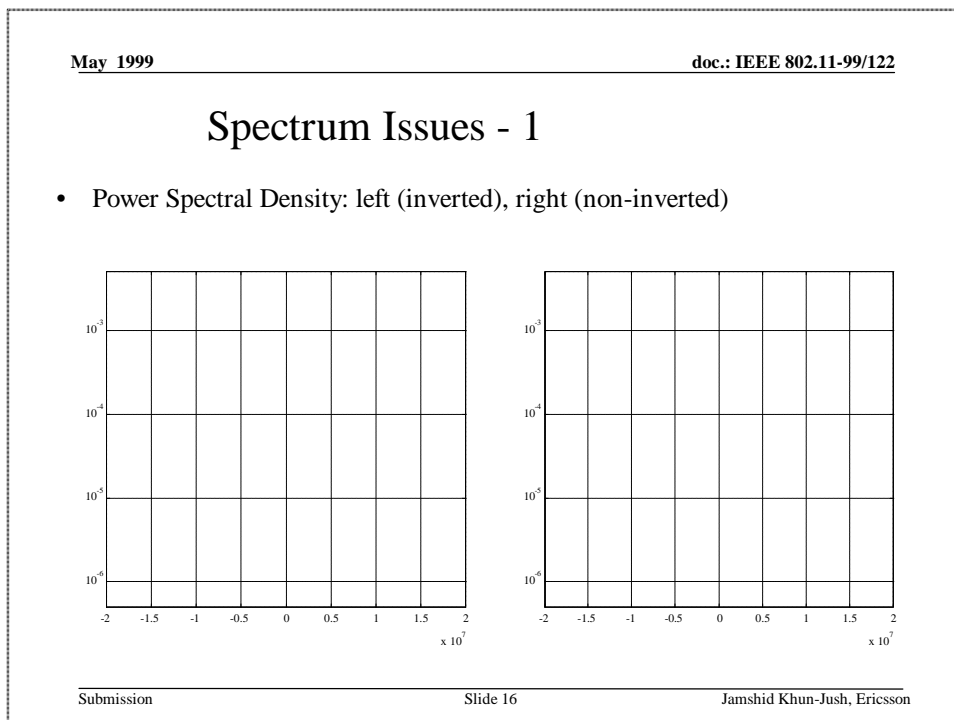
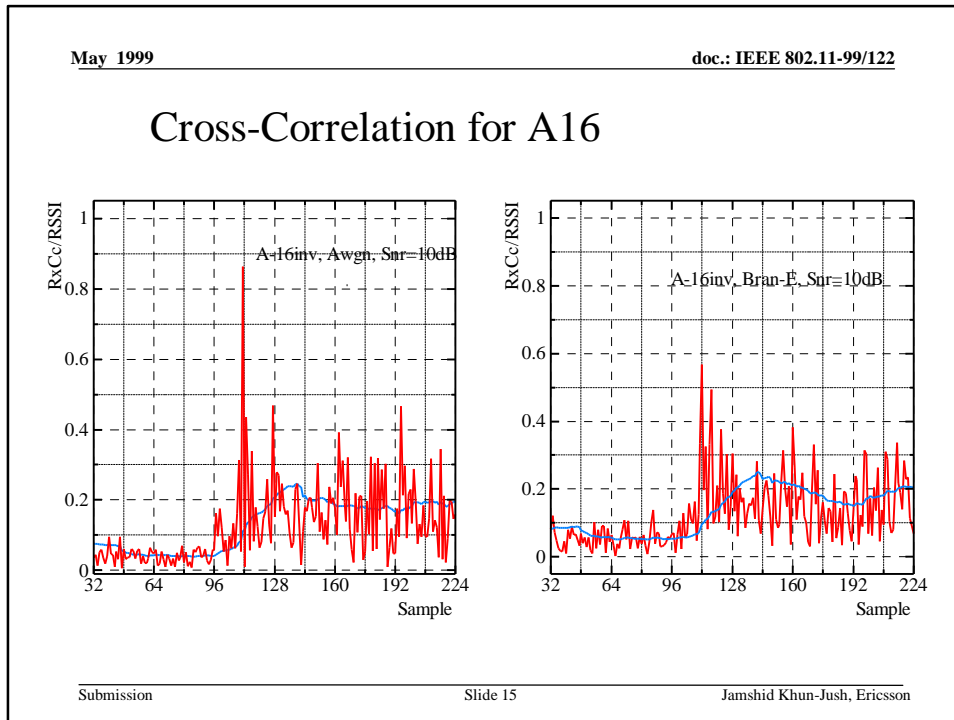
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Cross-Correlation for A16

A-16, Awgn, Snr=10dB

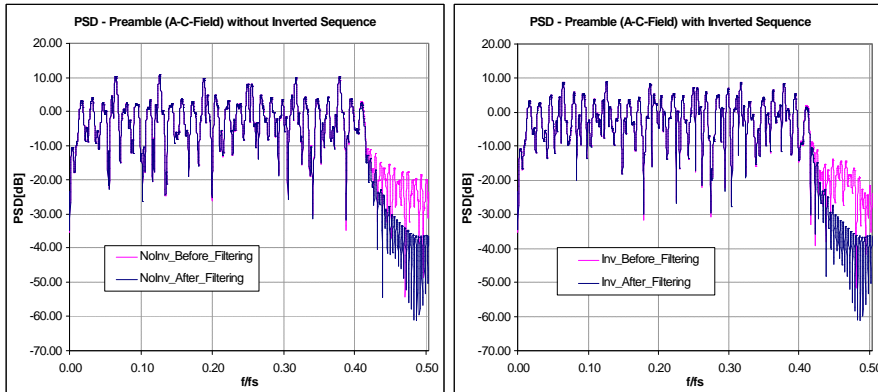
A-16, Bkwn-E, Snr=10dB

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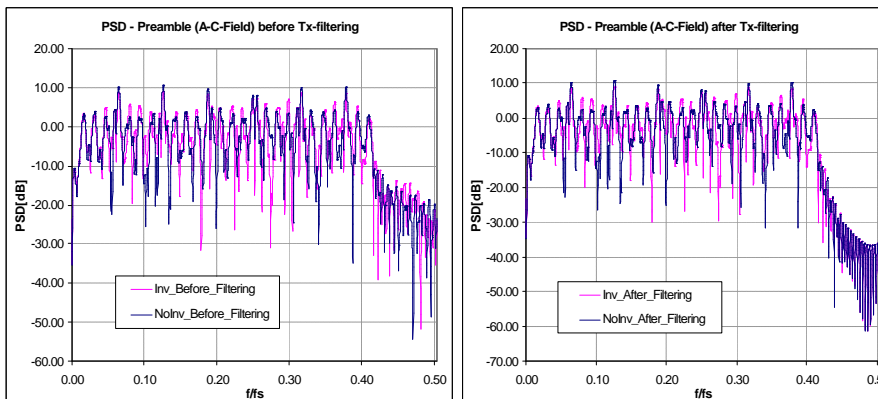
Spectrum Issues - 2

- TX signal filtering (FIR filter): only preamble
 - 8 MHz cut-off frequency, -60 dB stop-band attenuation



Spectrum Issues - 3

- TX signal filtering (only preamble)



Spectrum Issues - 4

- TX signal filtering: data and preamble

