Analysis of the performance of sum product decode algorithm in Gaussian channel for random matrices

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Introduction

- The presentation shows the performance of sum product algorithm in Gaussian channel using random matrices.
- The table presented shoes the first block error occured in 10 million transferred blocks.

Notations

- n - Block size.
- Eb/No - Input SNR in db to maintain input BER between 10^{-2} to 10^{-3}.
- BER(IN) - Input bit error rate.
- BER(OUT) - Output bit error rate.
- CDB - Number of correctly decoded blocks.
- Itr - Average number of iterations per block.

First error till 10 million blocks

n$\simeq$	BER(In)$\simeq$	R=0.75	R=0.8
4K	$1.0x10^{-2}$	19,504	30,015
	$0.5x10^{-3}$	5,71,913	4,83,435
	$1.0x10^{-3}$	No error	8,15,278
8K	$1.0x10^{-2}$	13,143	2,51,695
	$0.5x10^{-3}$	3,87,032	81,315
	$1.0x10^{-3}$	No error	No error
12K	$1.0x10^{-2}$	2,90,653	46,640
	$0.5x10^{-3}$	2,71,712	1,75,367
	$1.0x10^{-3}$	No error	No error

First error till 10 million blocks

n$\simeq$	BER(In)$\simeq$	R=0.85	R=0.9	R=0.95
4K	$1.0x10^{-2}$	801	22	-
	$0.5x10^{-3}$	1,10,751	14,949	-
	$1.0x10^{-3}$	7,75,381	57,248	-
8K	$1.0x10^{-2}$	12,825	2,046	-
	$0.5x10^{-3}$	2,901	21,865	-
	$1.0x10^{-3}$	No error	No error	-
12K	$1.0x10^{-2}$	18,298	8,701	
	$0.5x10^{-3}$	2,277	6,010	
	$1.0x10^{-3}$	No error	No error	