

Estimate interleave of LDPC

Gaobo(Huawei)

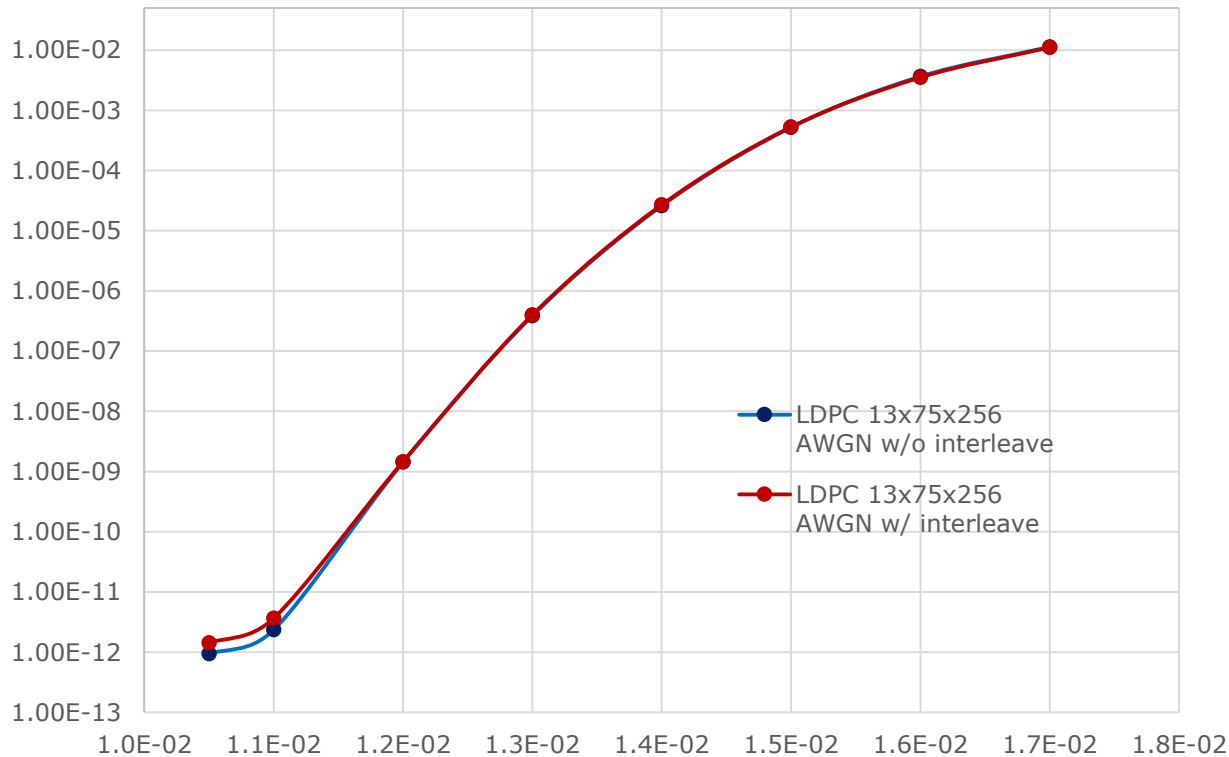
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Background

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- ❑ LDPC(18493,15677) with omega256 structured interleave has been motioned to use in downstream at Orlando meeting and also use in upstream at Geneva meeting.
- ❑ This presentation will estimate the implementation penalty and benefit of the omega256 structured interleave presented in laubach_3ca_1_0517.pdf pages 10 and 11 with seed code as in laubach_3ca_2_0517.txt.

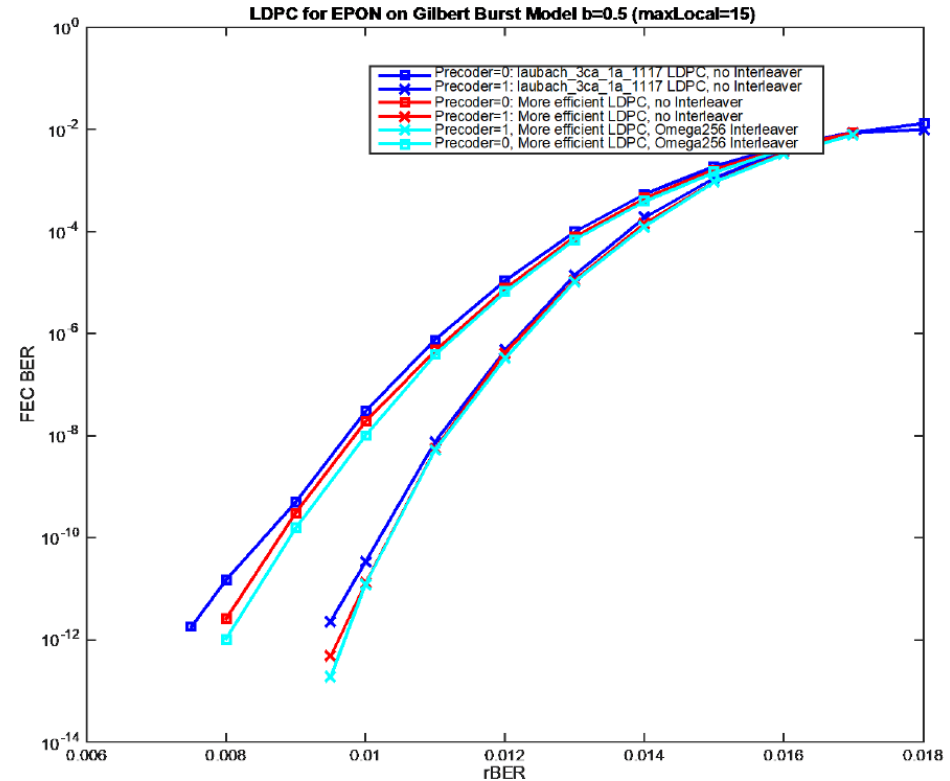
Benefit of omega256 (1/2)



- LDPC without interleave still can meet the performance requirement(1e-2 correct to 1e-12)
- The interleave cannot bring any gain

Benefit of omega256 (2/2)

	Length	Rate	Non-Zero Blocks	NECG ¹ (dB) (optical gain)	
				AWGN	Gilbert Burst
LDPC	(18493,15677) [13x75x256]	0.848	290	2.6 (1.82-2.34)	1.76 ³ (1.23 - 1.58)
					2.03 ⁴⁷ (1.41 - 1.82)
			286	2.63 (1.84 - 2.37)	1.87 ³ (1.31 - 1.68)
					2.12 ⁴ (1.48 - 1.91)
		1.85 ⁵ (1.3 - 1.67)			
		2.11 ⁶ (1.48 - 1.9)			



laubach_3ca_1b_0118.pdf

- ❑ LDPC with interleave still can not meet the performance requirement(1e-2 correct to 1e-12)
- ❑ The interleave cannot bring obvious gain(<=0.01 OdB)

Penalty of omega256

❑ Cost 12.7K gates

- Assume based on 256-bit bus
- 128 switches/stages(express 256 status)
- 128 x MUXes(16gates for each)
- 75 x 128 bits ROM(1gate per bit) to store seeds for all blocks of CW
- 128 registers(8gates for each) to save fetched seed

❑ 2 clock cycles delay

- Encode and decode both introduce 1 clock cycle delay

- ❑ Omega256 structured interleave cannot bring any gain in both AWGN and Gilbert channels
- ❑ We only need LDPC without interleave for simplify

Thank You

Straw poll

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- I agree to remove omega256 structured interleave presented in laubach_3ca_1_0517.pdf pages 10 and 11 with seed code as in laubach_3ca_2_0517.txt for downstream and upstream channels.

Yes:

No:

Don't care:
