Study of PBO Policies Based on Receiver Power

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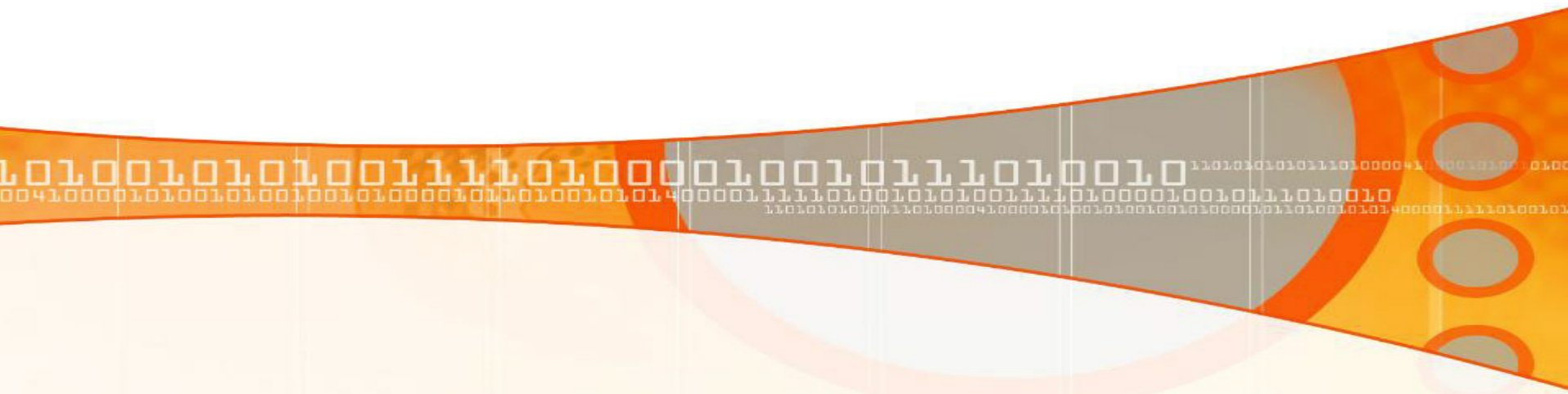
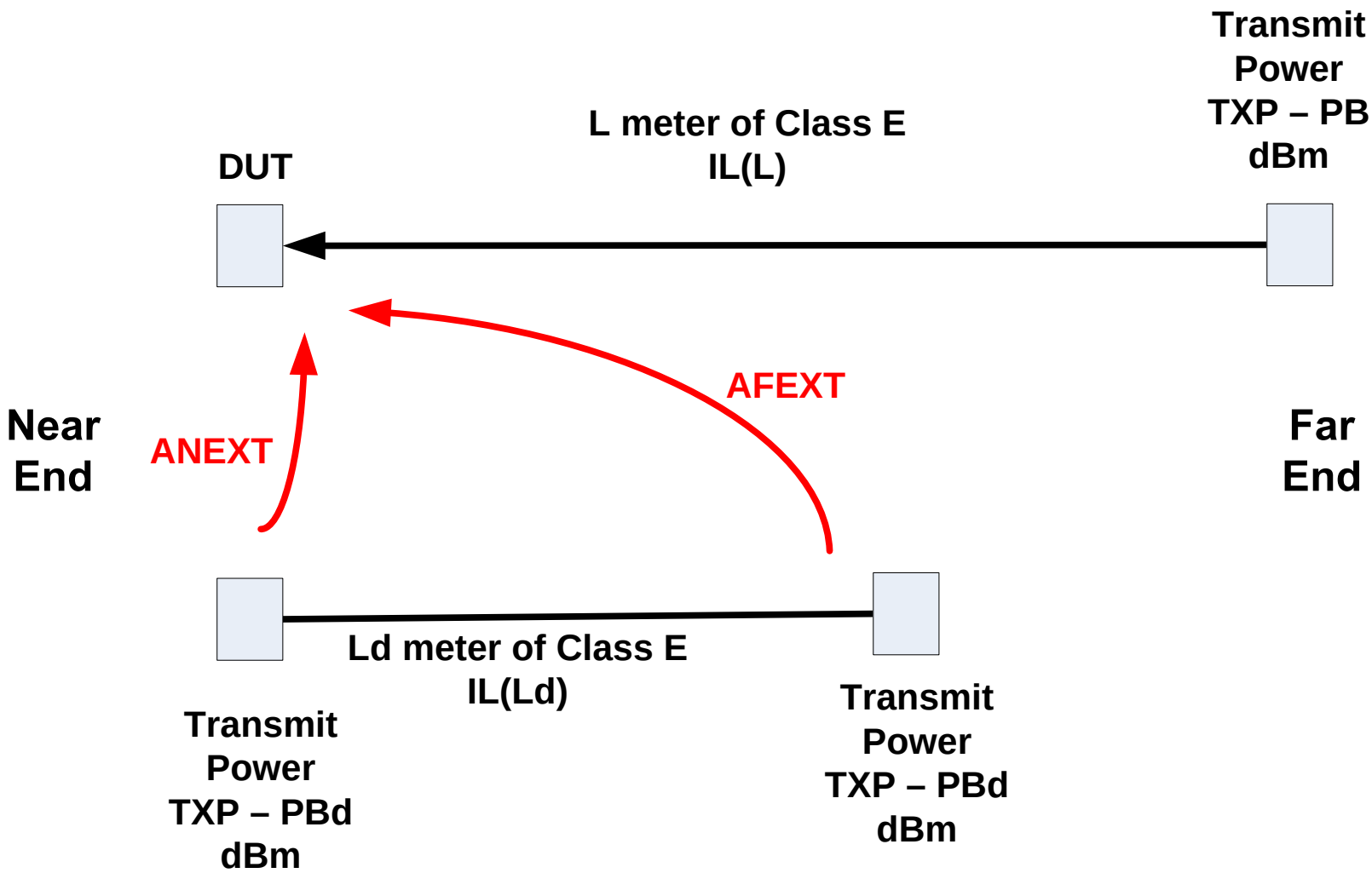


IEEE 802.3an: 10BASE-T Task Force

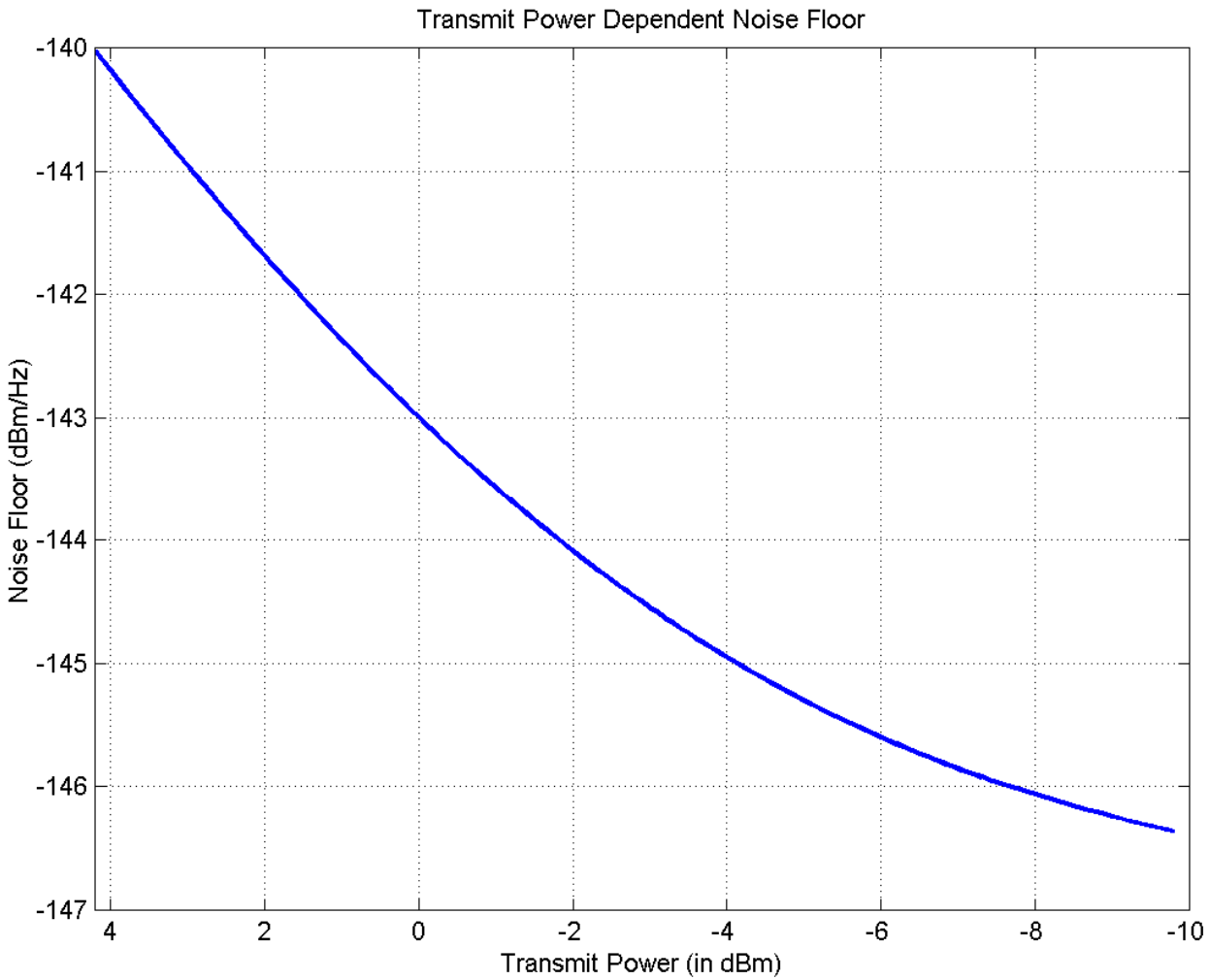
Collocated Near End Transceivers



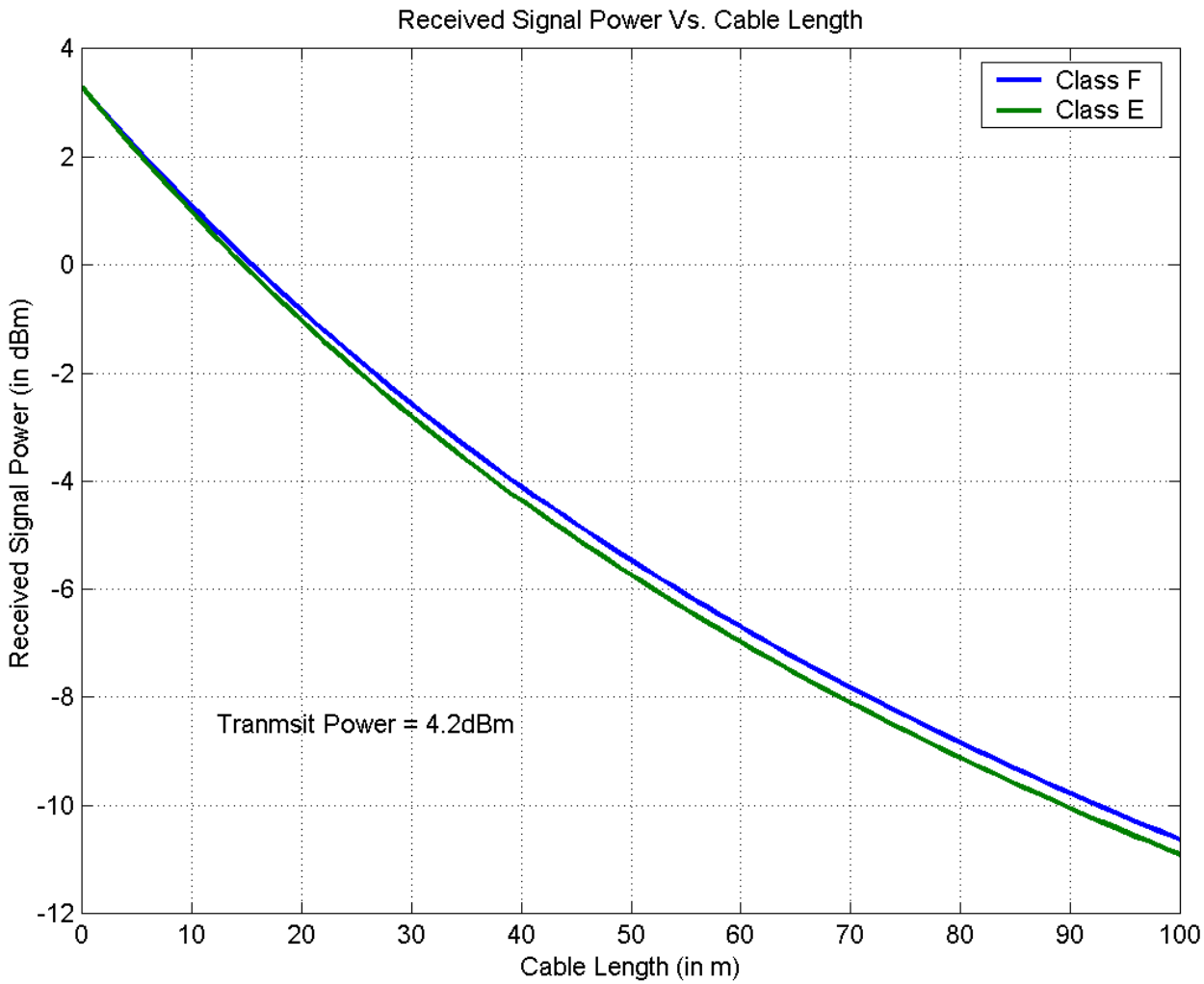
Models For Simulation

- All link models are based on D1.4
  - For details see halder_1_0205.pdf
- Transmit PSD
  - Transmit Filter: Second order with fc at 500MHz
  - Transformer: first order lower cutoff at 200KHz
- Noise condition
  - AFEXT, ANEXT, Transmit distortion
  - Transmit power dependent noise floor
    - Fixed noise floor: -147dBm
    - Transmit power dependent residue: -145.2+TXP dBm
    - Total noise floor is the sum of these two components

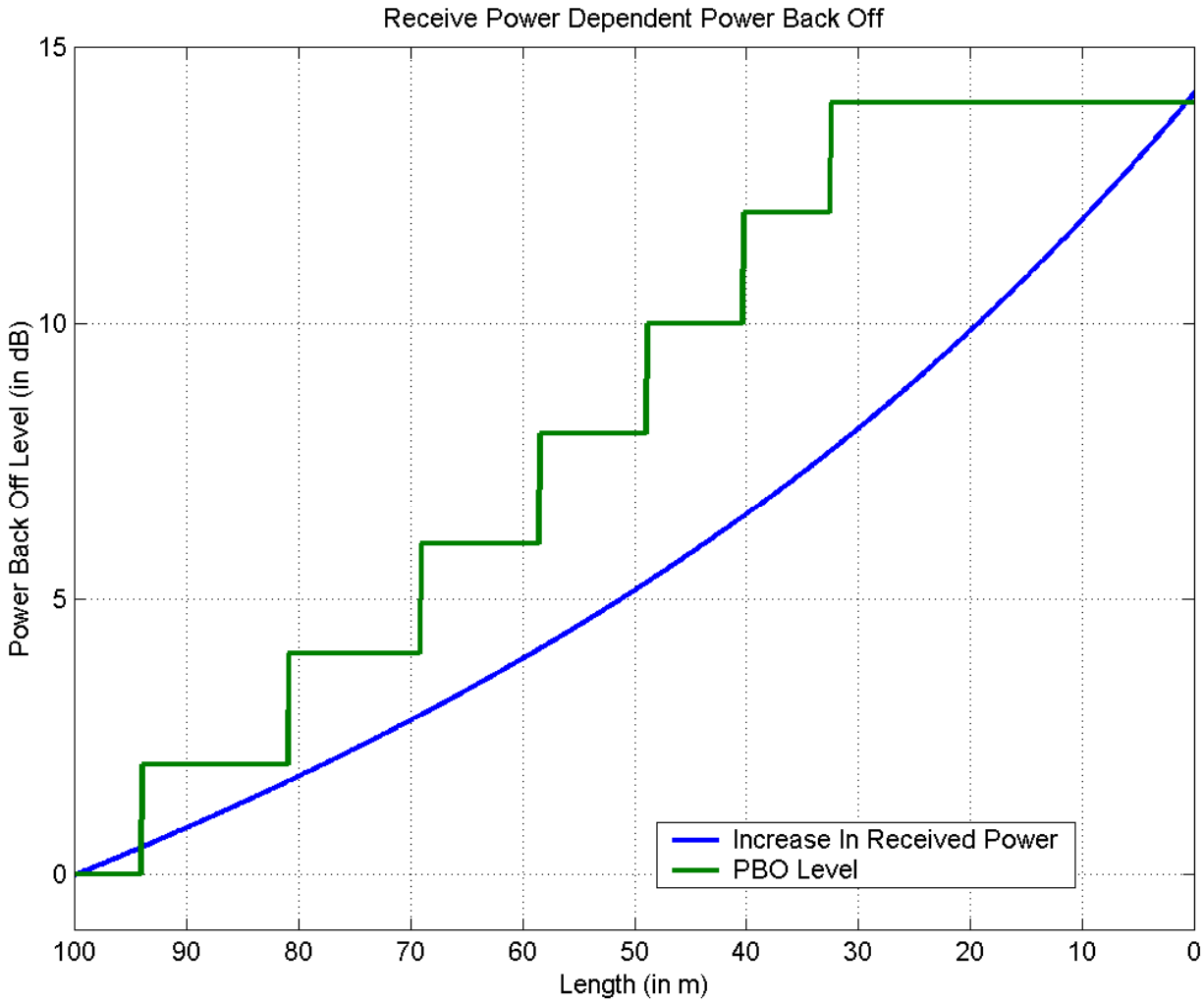
Transmit Power Dependent Noise Floor



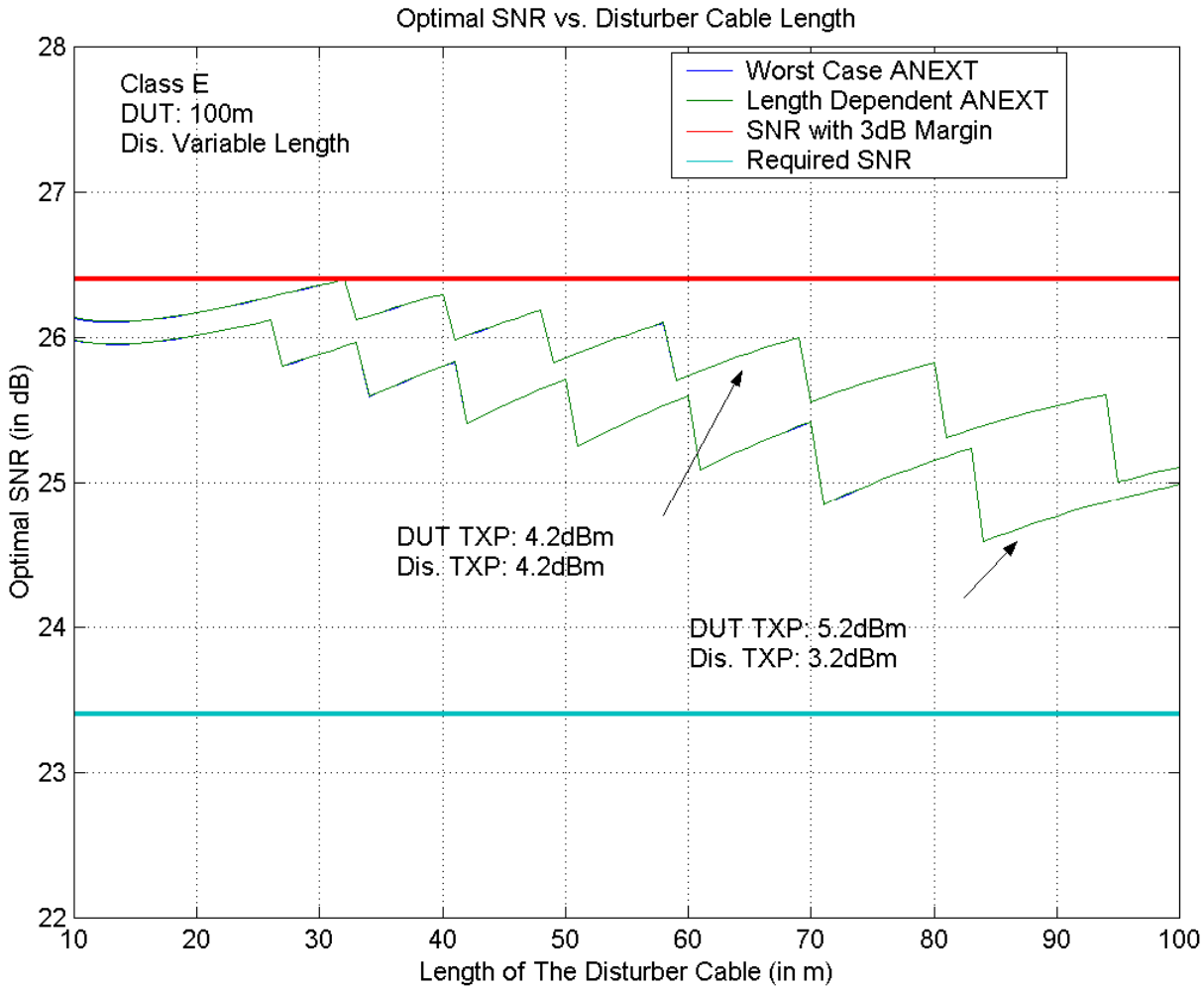
Received Power Vs. Length



Received Power Based PBO: Ex1



SNR Performance: PBO Ex1

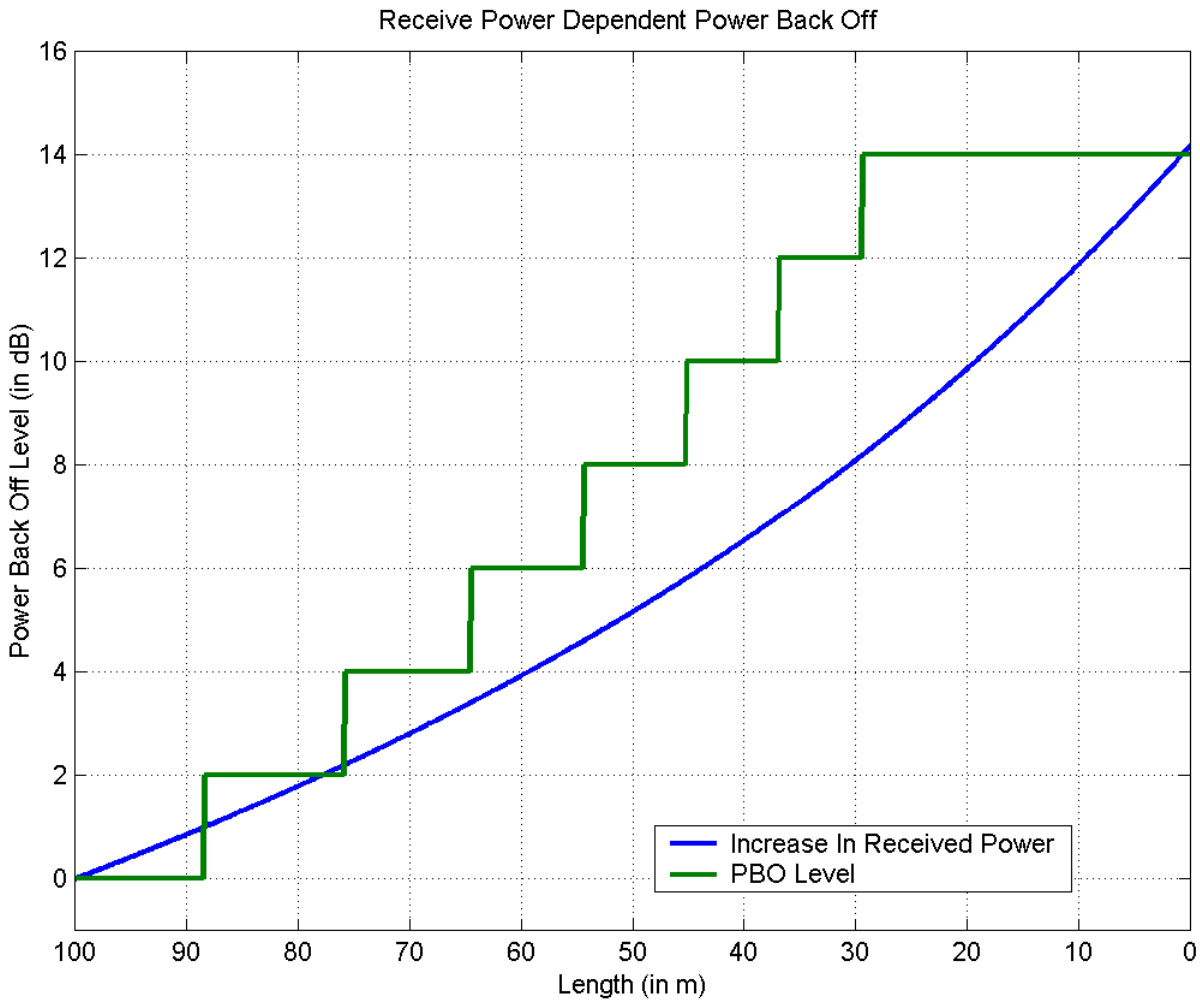


Observation: Aggressive PBO

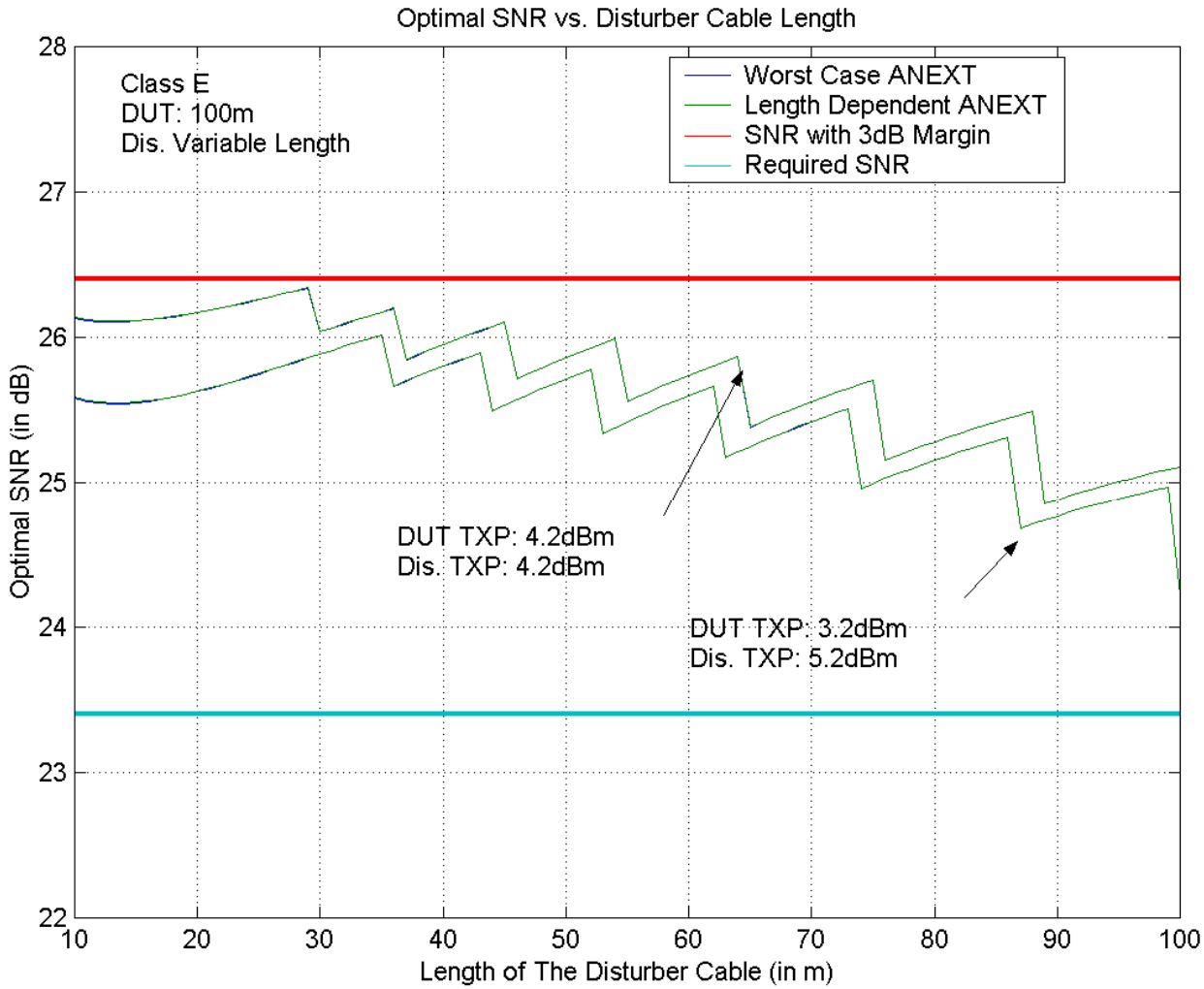
- Helps when transmit powers are the same
- But suffers when the DUT has higher power than the disturber
  - SNR margin < 1.5dB

- How robust is it to apply a 2dB power back off based on 0.4db difference in receive signal power?

Received Power Based PBO: Ex2



SNR Performance: PBO Ex2



Observation: Relaxed PBO

- Helps when DUT power is high
- But suffers when the DUT has lower power than the disturber
  - SNR margin < 1.5dB

Conclusions

- Receiver power based PBO policies cannot
  - Alleviate the SNR loss due to transmit power variation
  - Guarantee even 1.5dB SNR margin

- We did not include
  - Fixed THP loss
  - Finite DFE loss
  - Transformer loss at the receiver
  - Loss due to transmit noise floor
  - LDPC loss due to SNR variation between pairs