

# Alien crosstalk and PBO

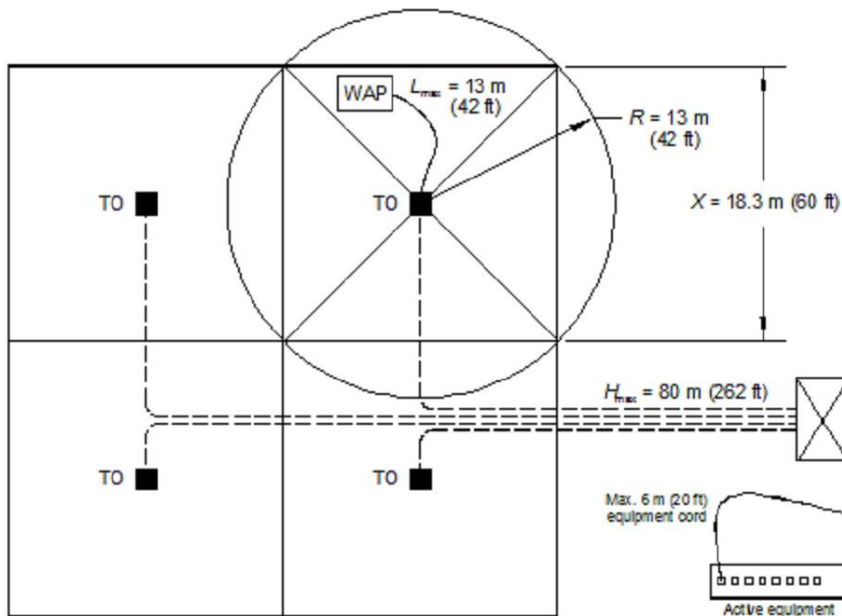
Dieter Schicketanz consultant  
Reutlingen University  
Dave Hess, Cord Data

# What is special on 802.3bz?

access points,

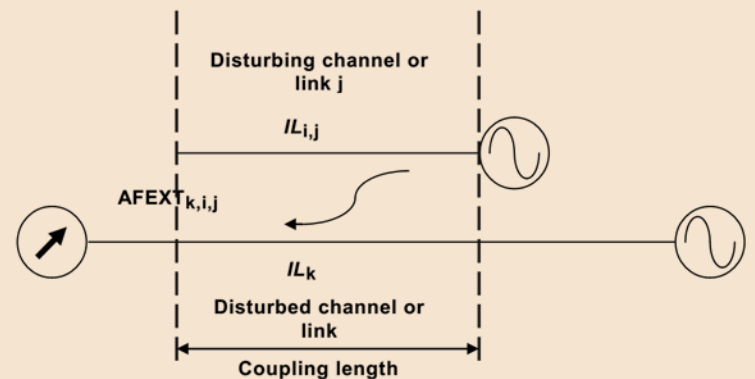
installed cabling (from Nordin Berlin)

## TSB-162 WAP Typical Uniform Cell Size



Cell sizing (wireless access point placed anywhere inside the cell)

Standard assumes short disturber at receiver end. This works OK except for very short lengths due to equipment patchcords. Disturbing signal attenuation is not considered.



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Figure F.2 – Example of increased impact of PS AFEXT.

# If the length of disturbing and disturbed channel are different PSAACR-F is curved.

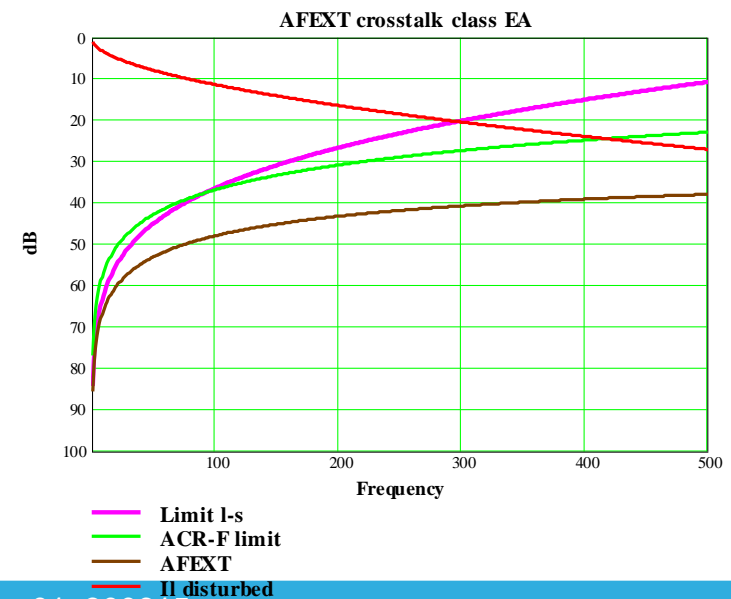
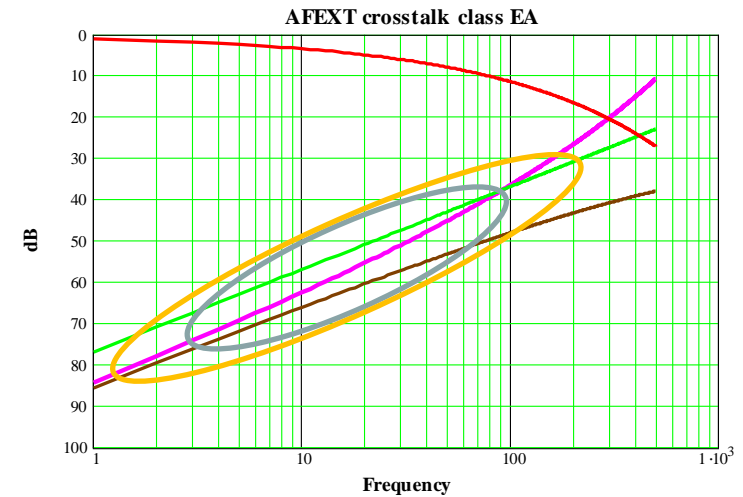
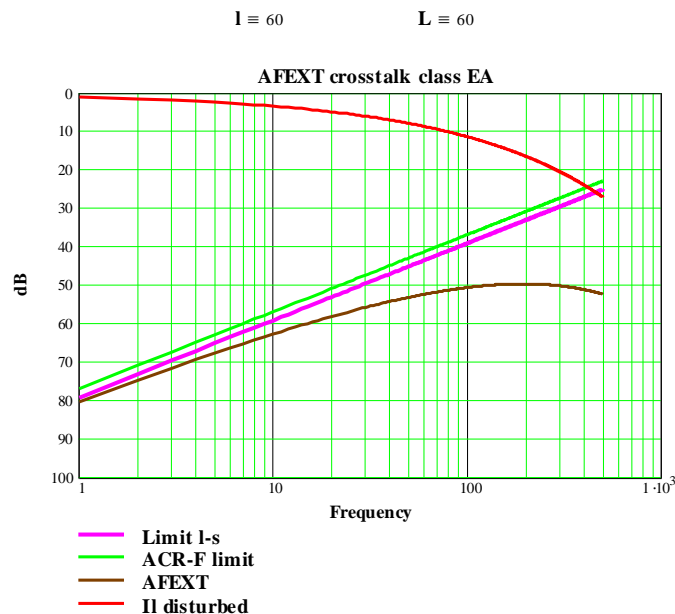
$l \equiv 60$

$L \equiv 15$

Therefore for SNR calculation the straight limit line should not be used.

2.5G

5G

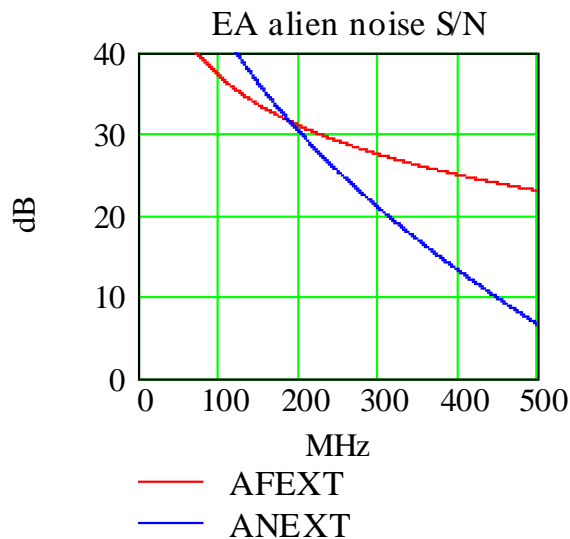
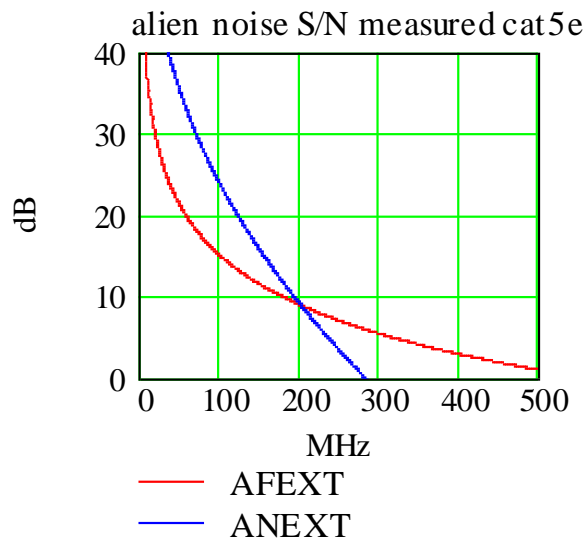


# CAT5e, Cat6 alien-XT offset from CAT6A

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- From wagner\_ngeabt\_01a\_0115 it can be deducted that for 100m the limit lines could be for cat5e:
  - PSANEXT :  $75-15\log(f)$  > 100 MHz 15 dB offset
  - PSAACR-F:  $55 -20\log(f)$  22 dB offset
- Proposal of 15 dB for cat5e is a good starting but does not match measurements, too optimistic
- Cat6 needs therefore to be considered too. Various presentations, 15 dB offset viable, insertion loss is less

# PSANEXT and PSAFEXT comparison

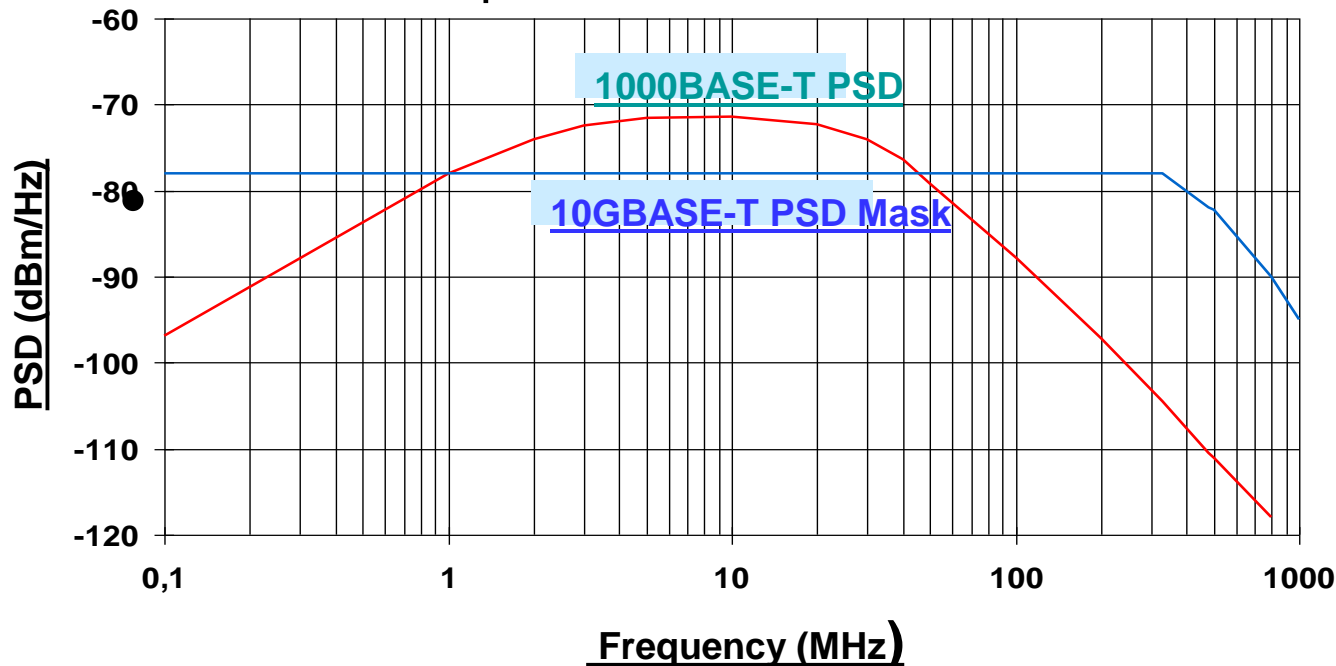


- Up to 200 MHz ANEXT always less

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- For more details see [Pittsburg Schicketanz\\_3bz\\_01\\_0515](#)
  - Disadvantage of PBO: less immunity to impulse noise

# PSD page 4-5 (Sedarat\_3bz\_01\_230615)

- Alien crosstalk is an attenuation
- To get power the transmit filter needs to be known
- How was it calculated, using PSD shown below?
- Is 2.5 and 5 defined?
- Could not reproduce the values



# PSAFEXT and SNR page 6 (Sedarat\_3bz\_01\_230615)

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- How was SNR calculated:
  - PSAFEXT –IL of disturbed pair
    - Curved PSAACRF line
  - PSAFEXT –IL of disturbing pair (usual calculation, limit line)
    - Straight line
  - Coupling length of disturbing pair different from channel length?



# page 10 (Sedarat\_3bz\_01\_230615)

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- Last Bullet

- Only 1/6 contributes but in power-sum
- Was that considered ?
  
- From Sedarat\_3bz\_01\_230615

- Mixed aggressor model: each of 6 aggressors contributes 1/6 to the total crosstalk power

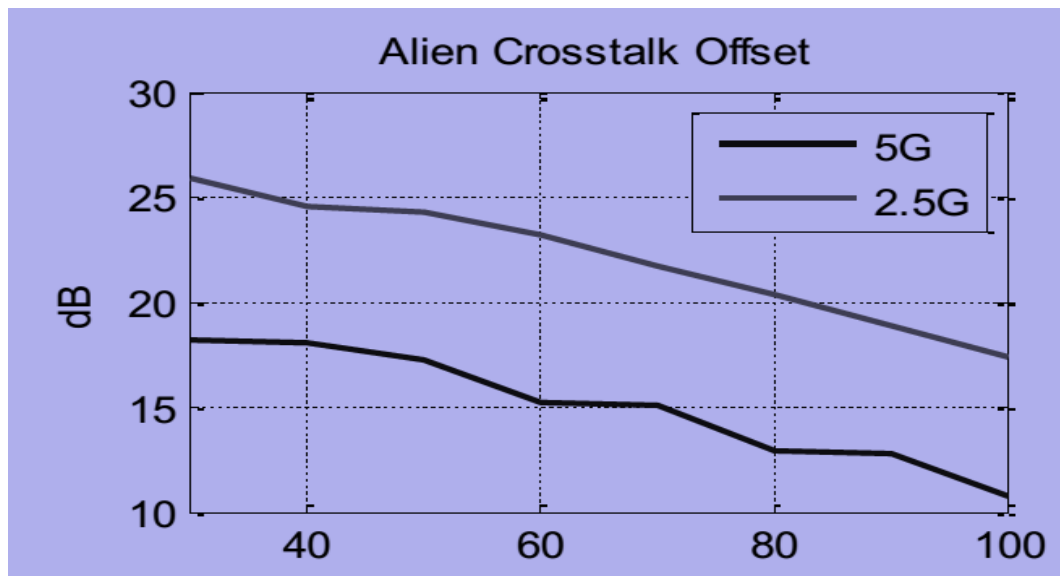
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# Alien noise offset page 17

(Sedarat\_3bz\_01\_230615)

- The offset needed for 5G is always less than measured 22 dB so therefore it would not run
- 2,5 G only for less than 75m.



100m channel,

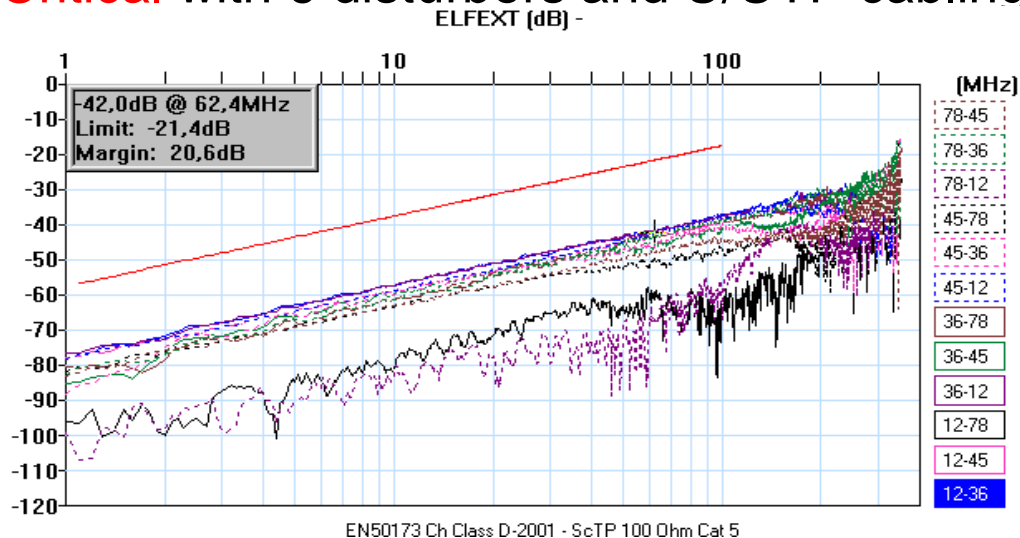
Varying aggressor length

Sedarat\_3bz\_01\_230615

# 1000Base-T and cat5e cabling

discussion June 23

- ACR-F hidden margin in most cablings
  - At 62.5 MHz ACR-F limit is 21,1 dB, for PAM5 + FEC borderline, but with hidden margin OK
- Alien noise with measured PSAACR-F offset of 22 dB
  - at 62.5 MHz 18 dB SNR at 100m
  - at 62.5 MHz 21 dB SNR at 50m
  - **Critical** with 6 disturbers and U/UTP cabling



Very old F/UTP  
Class D measurement  
PSAACRF negligible  
Usual in central Europe