Comparative Channel Measurements with and without MDIs

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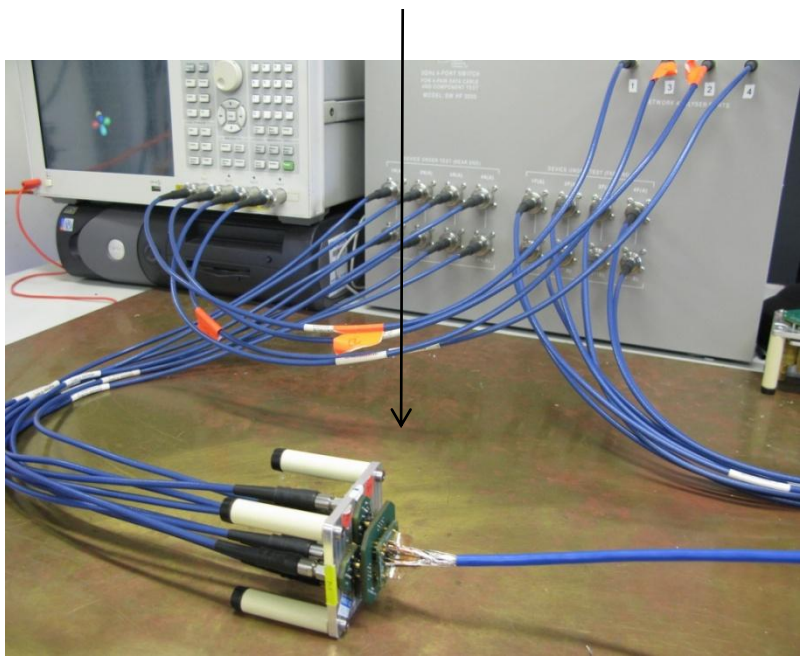
Overview

- Introduction
- Test Setup and Components
- Measurement Data
- Summary

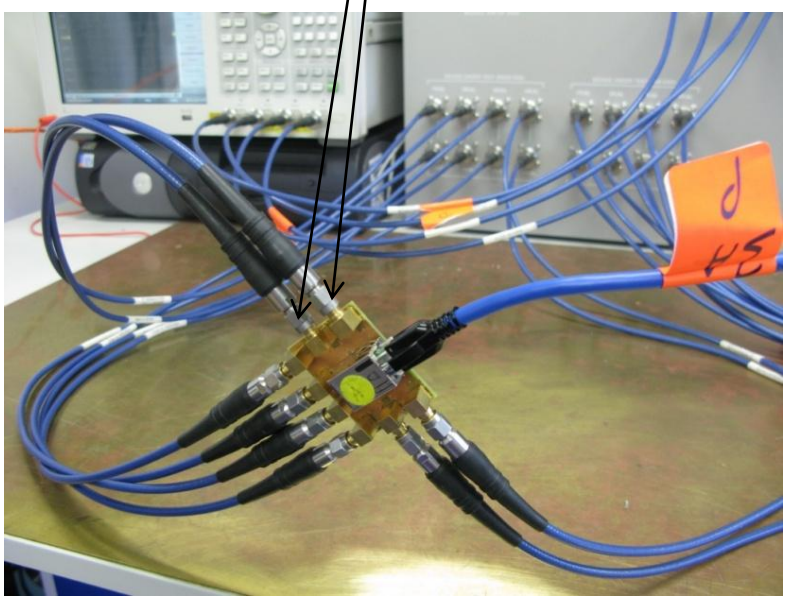
- New Channel testdata : what‘s different to data already submitted ?
  - Other Cable :
    - Larger wire size of AWG22 to show lowest IL practical
    - Horizontal cable rated up to 1800MHz (out of current production)
  - Other Connectors but still IEC60603-7-71 / 7-82) :
    - Modified connector to improve High Freq IL and RL above 1400MHz
  - Measurements made with and without MDI connector to allow direct understanding of MDI influence

Test Setup

- „Channel 3-24-3“
  - Typical cabling channel : Network analyer & switch box connected to OCC testfixture to patch cable
  - Calibration to end of cable

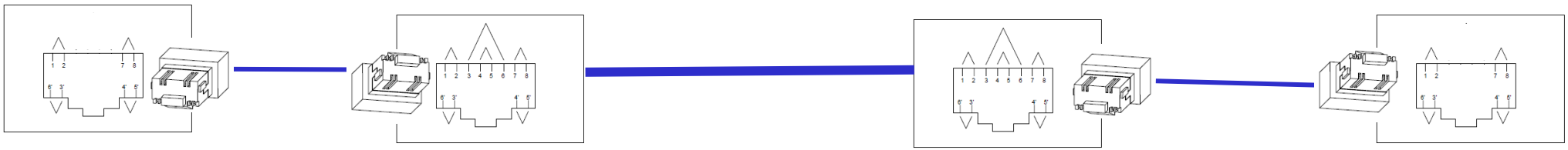


- „Channel MDI-3-24-3-MDI“
  - Network analyers & switch box connected to testboard with ARJ45 8 –way connector (IEC61076-3-110)
  - Calibration to end of coax leads

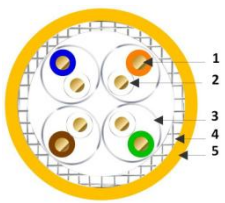


  - Additional components in testdata: 1 GG45 Plug / 1 MDI Jack / Testboard / SMA connectors

Components used



- Cable



1800MHz S/FTP AWG22 / OD = 8.3mm

- Patch Cable

2000MHz SFFTP AWG Solid Wire AWG26 / OD = 6mm

- Cable Jack

2000MHz GG45 12-way (IEC60603-3-82)

- Plug

2000MHz GG45 8-way (IEC61076-3-110)

- MDI

ARJ45* 8-way (IEC61076-3-110)

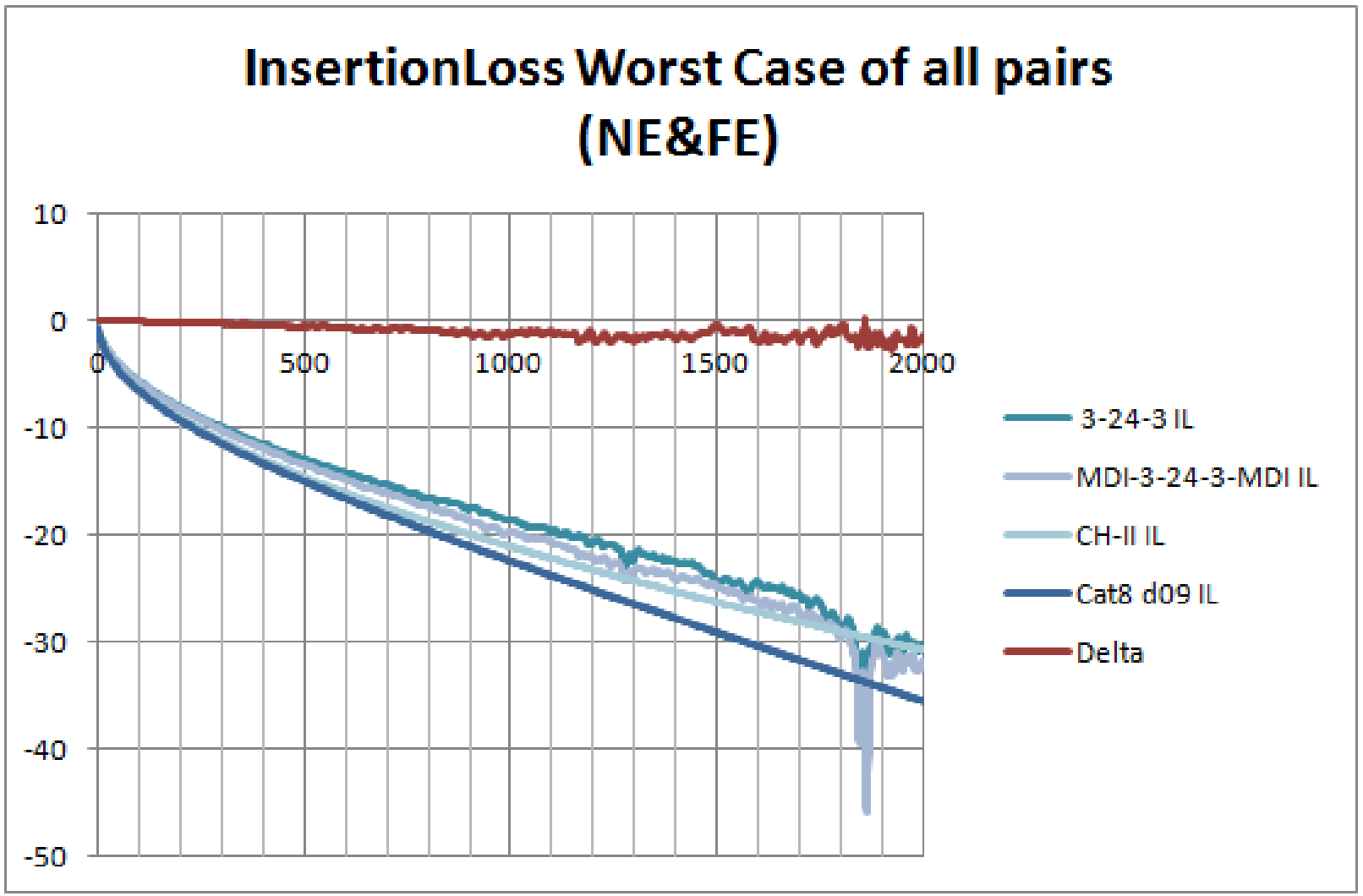
*Thanks to BelStewart to provide the MDI Connector

Limits

- 2 sets of limits for comparison (both still at stake for baseline proposal)
  - TIA Cat.8 draft 09
  - ISO CH-II
- Recent changes of ISO CH-I and TIA Cat 8 in order to align specifications not incorporated yet
  - IL changes seam significant and will be closer to CH-II

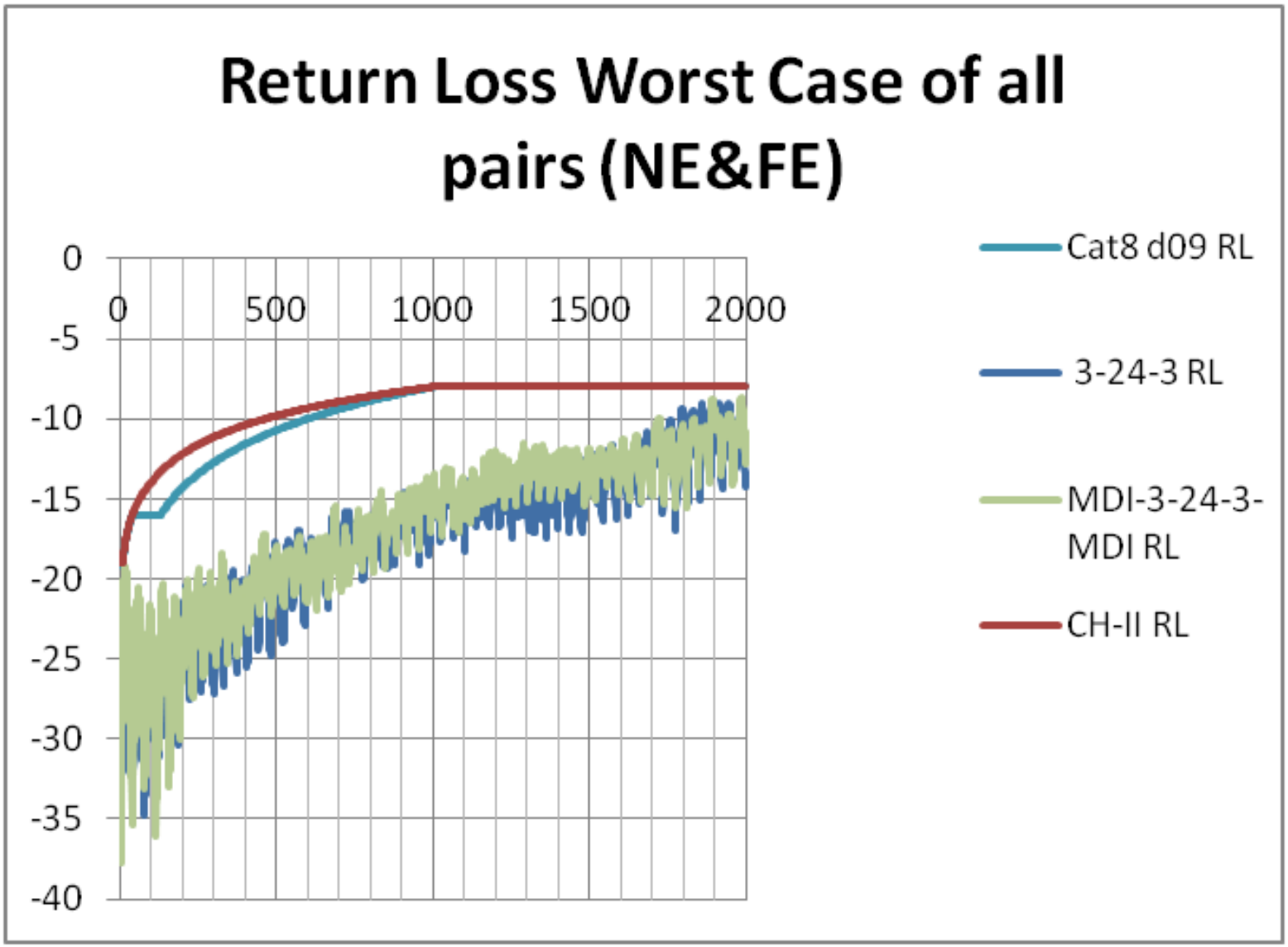
Insertion Loss

- Improvement in IL compared to Cat8 spec due AWG22 Wire size
- Suck out > 1800MHz is fully understood and can be removed
- ➔ Significant contribution from MDI Portion; up to 3dB
- CH-II limits feasable with MDI included



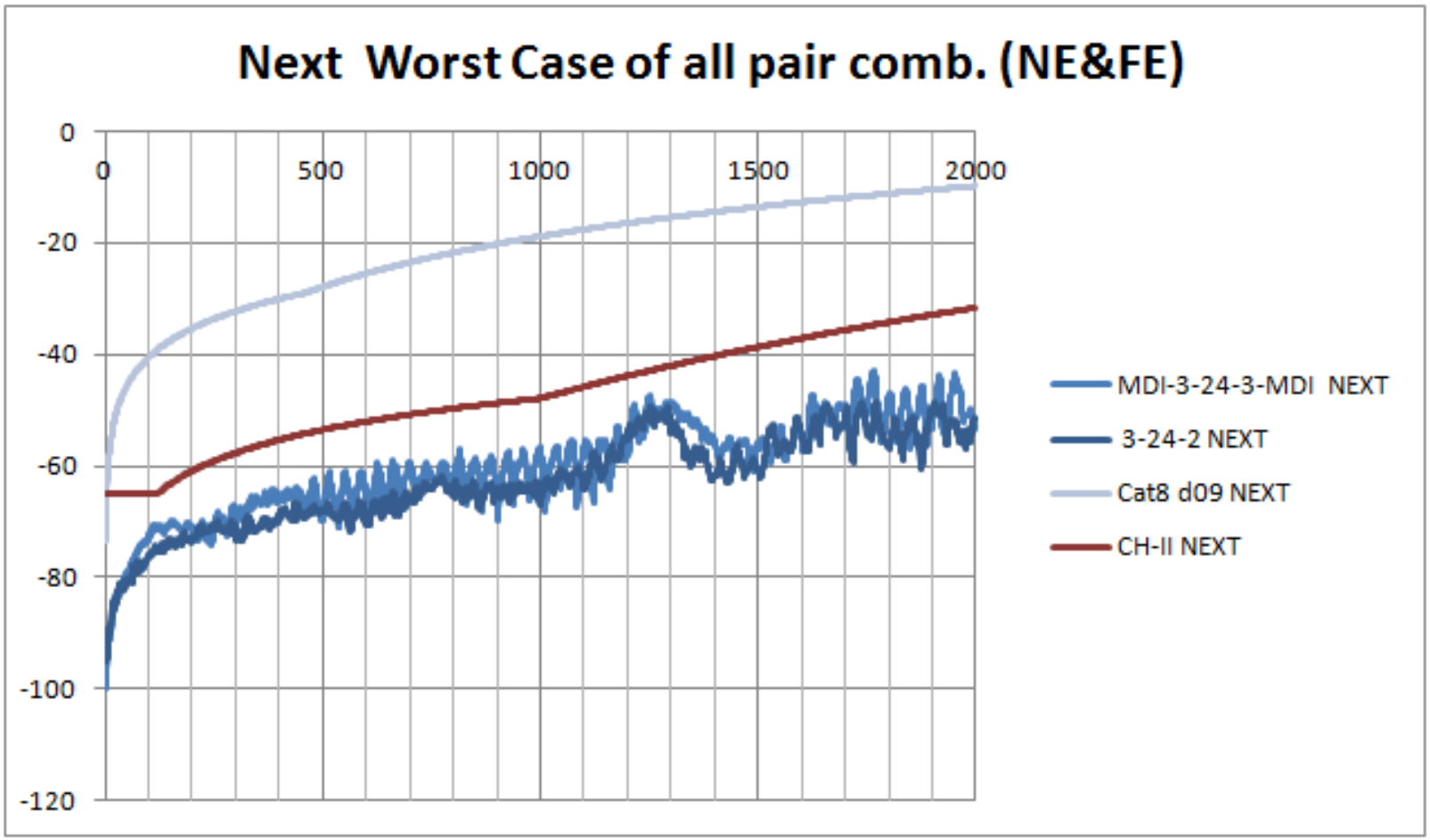
Return Loss

- ➔ No significant contribution from MDI Connector

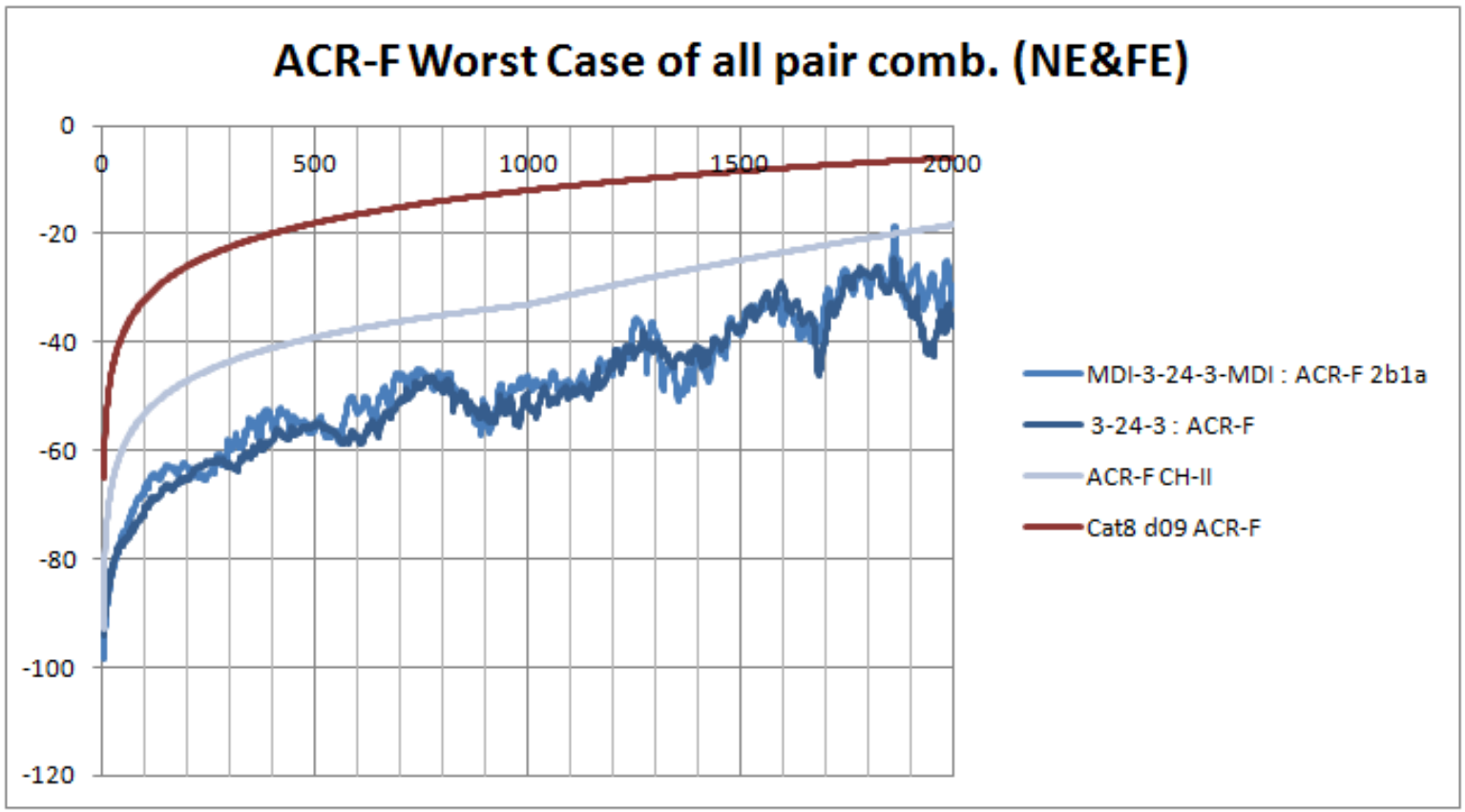


NEXT

- Minor contribution of MDI
- CH-II feasable with MDI portion included



- Minor contribution of MDI
- Spike > 1800MHz due to Cable IL (can be removed)
- CH-II specs feasable with MDI portion included



Conclusion

- 2 new S16P files for long channels available for study
  - Lowest IL of current datasets to study benefits of AWG22 wires
- Significant Impact of Non RJ45 MDI connector only in IL
  - Can be compensated by cable improvements
- CH-II specifications feasable with MDI Portion included
  - note: MDI without Isolation / Magnetics still to be added
- Next Steps:
  - More configurations esp. short channels